

New York Show Issue

MOTOR AGE

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Number 1

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Thirty-five Cents a Copy
Three Dollars a Year

THE records of the industry reveal the Great Jordan Line Eight as one of the best selling cars in America, quality, class and price considered.

Edward S. Jordan

President
Jordan Motor Car Company
Cleveland, Ohio

“The Pistol Grip and Trigger Switch”

. . . Fifteen years ago two partners started a jobbing machine shop.

Being practically unknown, the only work they could get at first was that which other machine shops turned away as extra hazardous.

This developed latent ability and daring in a way that nothing else could; resulting in an organization of precision specialists. They made adding machines, currency presses for the Government, milk bottle cap machines, motion picture projectors, postage stamp machines, firing mechanisms for guns, duplicators, gunsights—a class of work requiring accuracy to the finest degree.

After several years, however, they decided to produce some commercial item which could be manufactured by them in between big jobs, providing a means for keeping their unusual organization intact.

Their own experience influenced them to undertake the manufacture of Portable Electric Drills, because they had found them among the most necessary tools in their own shop.

They analyzed the crude electric drills then being used, and determined to make Black & Decker Portable Electric Drills more powerful, lighter in weight, longer lived, and more easily controlled.

The most perfect control ever devised by man for operating a mechanical device is the “trigger.” From the time of the first cross bow to the present-day automatic pistol, the control of the index finger on a trigger has triumphed over other methods.

It was quite natural to carry this idea out and this was the origin of

“The Pistol Grip and Trigger Switch”

This method of control for electric tools originated with Black & Decker and the genuine “*Pistol Grip and Trigger Switch*” is found only on Black & Decker Tools.

Mechanics who use Electric Drills can readily distinguish the genuine Black & Decker by the “*Pistol Grip and Trigger Switch*.”

Other radical improvements followed, of which we hope to tell more later.

The little machine shop disappeared long ago and a large factory grew in its place; then a larger plant in the country, which, even as this is written, is being further enlarged.

Black & Decker Portable Electric Drills, Electric Screw Drivers, Electric Socket Wrenches and Electric Grinders may be obtained from the leading mill supply, machinery, automotive and electrical supply houses.

THE BLACK & DECKER MFG. CO.
TOWSON, MARYLAND, U. S. A.

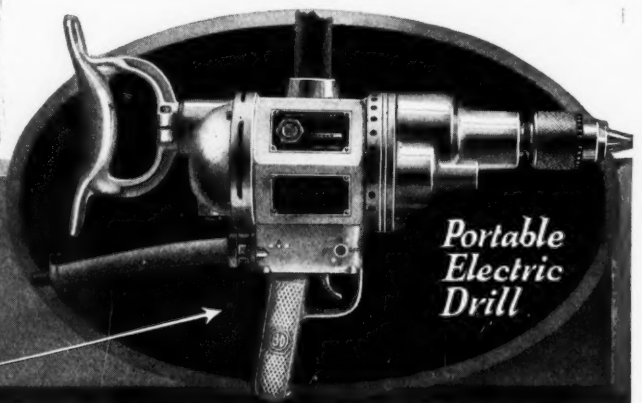
Canadian Factory—Lyman Tube Bldg., Montreal, P. Q.

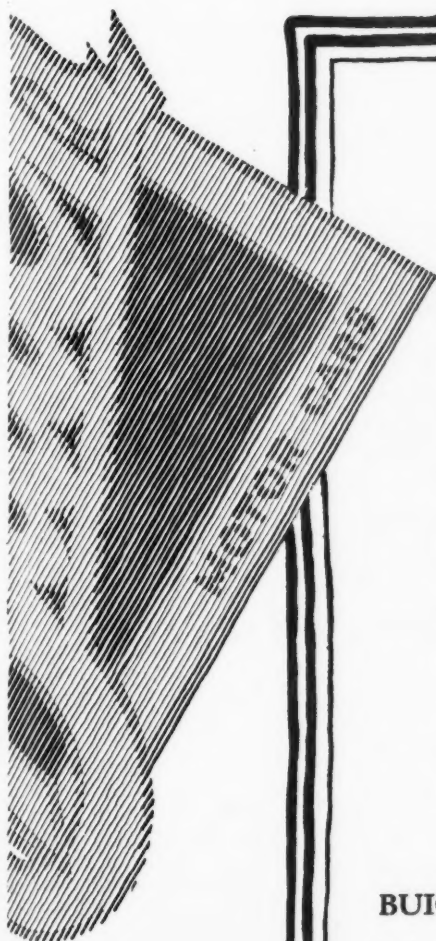
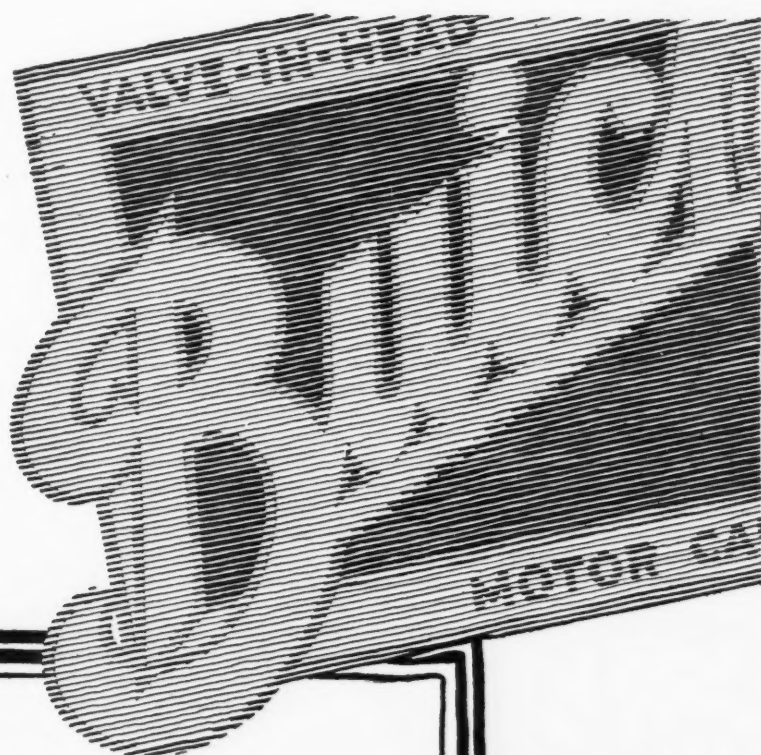
its part in Modern Industry~



BLACK & DECKER

“With the Pistol Grip and Trigger Switch”





The spotless manufacturing record of the Buick Motor Company is one of the biggest assets of a Buick dealer. People expect nothing but the best from Buick, and business is good with Buick dealers 365 days a year.

Why Not Have Your Name on File!

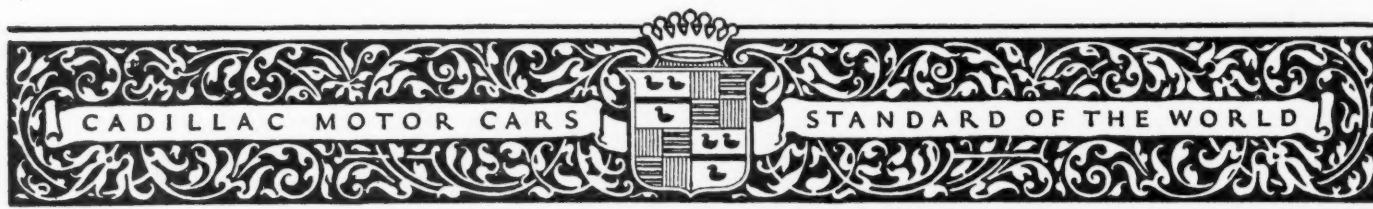
BUICK MOTOR COMPANY, FLINT, MICH.

Division of General Motors Corporation

Pioneer Builders
of Valve-in-Head Motor Cars

Branches in
All Principal Cities—Dealers Everywhere

WHEN BETTER AUTOMOBILES ARE BUILT, .BUICK WILL BUILD THEM



Cadillac Dealers Enter • •

upon the season of 1925 with public favor for the Cadillac at its highest point and with the finest and most varied line of Cadillac cars ever presented, including the following V-63 models:

A new Coach of true Cadillac quality, with large, finely proportioned five-passenger Fisher Body on the V-63 chassis, selling at the same price as the Touring Car and attracting thousands of new purchasers to the Cadillac line.

Standard Cadillac cars in ten beautiful open and enclosed body-types by Fisher, combining the utmost in performance, comfort and convenience, and forming now, as in the past, the broad foundation of the Cadillac manufacturing and sales program.

Six exquisitely beautiful V-63 models with Custom-Built Cadillac Bodies by Fisher in twenty-four master color harmonies and ten upholstery patterns, representing the supreme expression of the body-builder's art, and affording the purchaser the opportunity to give expression to his individual tastes.

*The Human Desire to
Own The Best Suggests
The Cadillac. ☞ ☞*

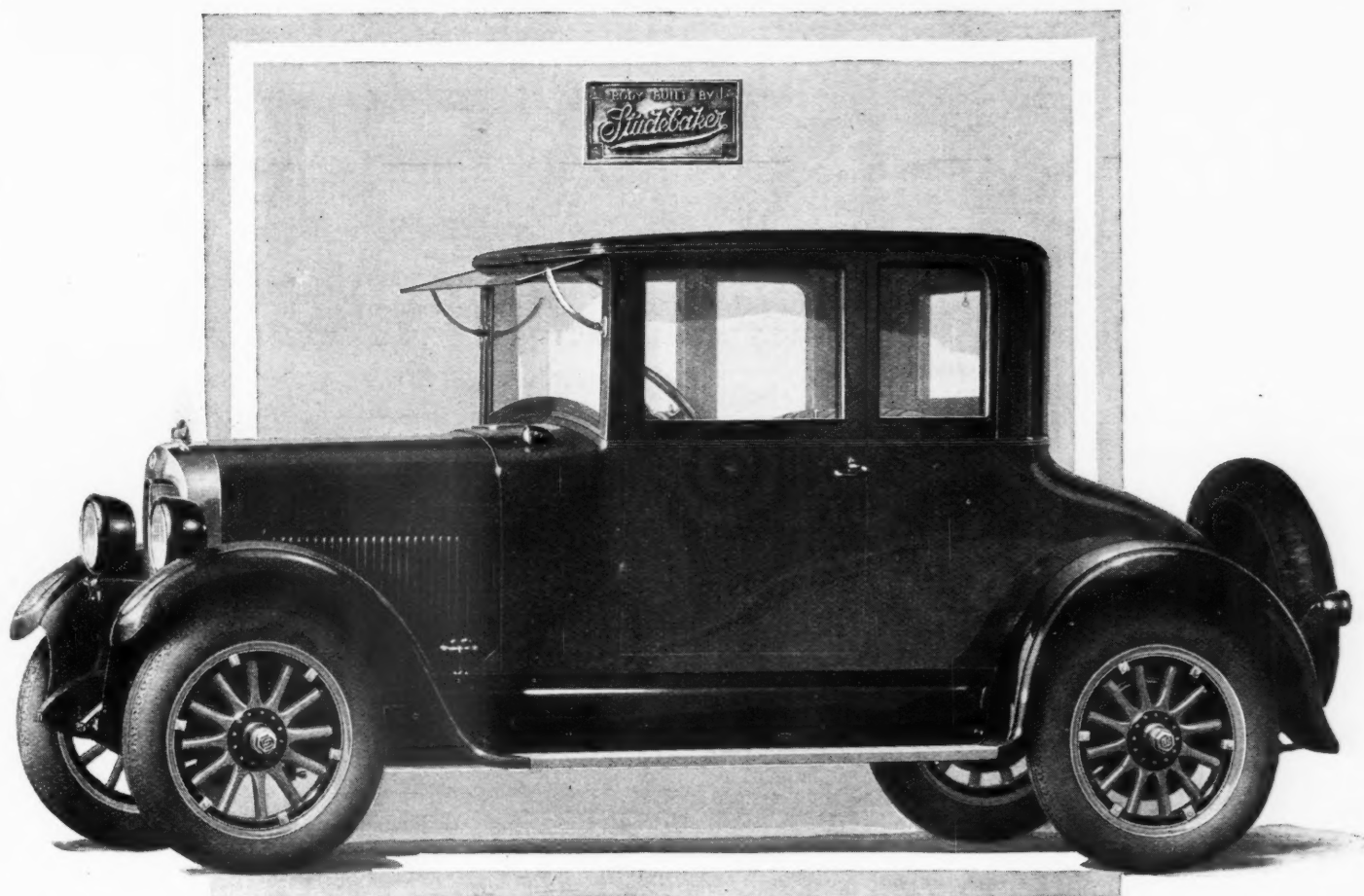
With this fine and varied V-63 line—dedicated to *the human desire to own the best*—Cadillac Dealers confidently look forward to an increased Cadillac leadership in 1925.

CADILLAC MOTOR CAR COMPANY, DETROIT, MICHIGAN
Division of General Motors Corporation

C A D I L L A C



STUDEBAKER



The New Studebaker Standard Six Coupe-Roadster

JUST as Studebaker has created the new DUPLEX type of body, Studebaker was the first to introduce a car of the Coupe-Roadster type—in 1920.

This type of car has been widely imitated, but the Studebaker Standard Six Coupe-Roadster is still supreme.

In appearance, power, performance,

riding comfort, room, luggage space and quality it is the ideal car for business and professional men, and small families.

The opportunities of Studebaker dealers are not limited to a single market; there are fifteen Studebaker models on three different chassis, which triple the sales advantages of Studebaker dealers and salesmen.

THE STUDEBAKER CORPORATION OF AMERICA, South Bend, Indiana

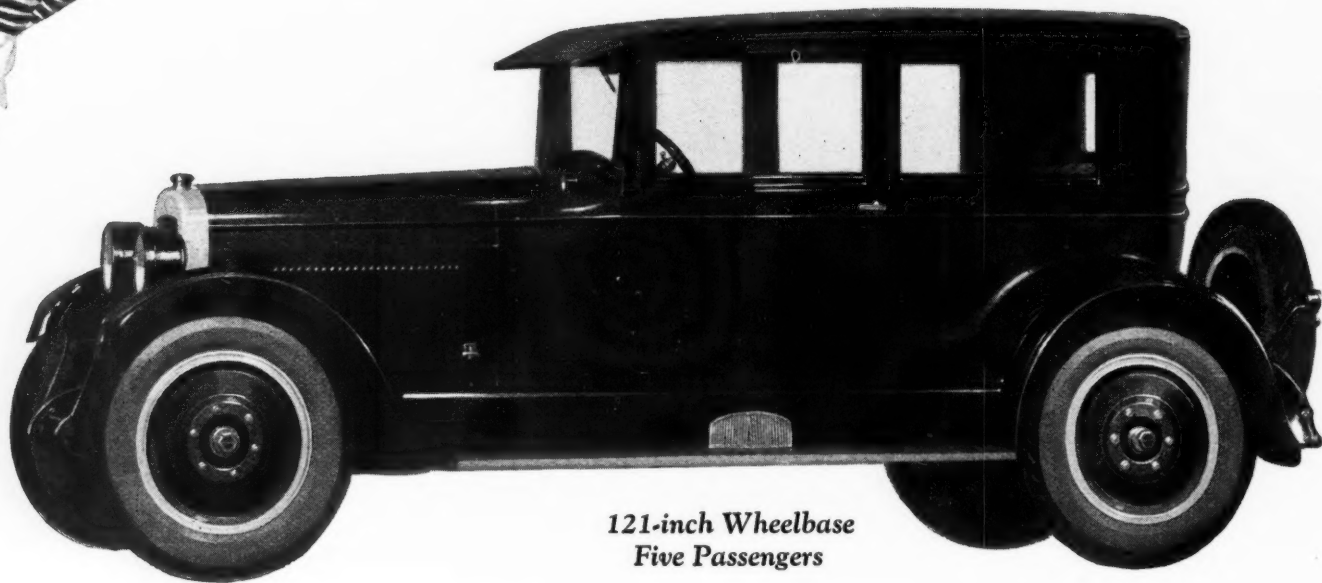
STANDARD SIX 113-in. W. B. 50 H. P.	SPECIAL SIX 120-in. W. B. 65 H. P.	BIG SIX 127-in. W. B. 75 H. P.
5-Pass. Duplex-Phaeton . . . \$1145	5-Pass. Duplex-Phaeton . . . \$1495	7-Pass. Duplex-Phaeton . . . \$1875
3-Pass. Duplex-Roadster . . . 1125	3-Pass. Duplex-Roadster . . . 1450	5-Pass. Coupe 2650
3-Pass. Country Club Coupe . . . 1395	4-Pass. Victoria 2050	7 Pass. Sedan 2785
5-Pass. Coupe 1495	5-Pass. Sedan 2150	7-Pass. Berline 2860
5-Pass. Sedan 1595	5-Pass. Berline 2225	
5-Pass. Berline 1650		
4-wheel brakes, 4 disc wheels, \$60 extra	4-wheel brakes, 5 disc wheels, \$75 extra	4-wheel brakes, 5 disc wheels, \$75 extra
(All prices f. o. b. factories, and subject to change without notice.)		

T H I S I S A S T U D E B A K E R Y E A R



NASH

ANNOUNCES



121-inch Wheelbase
Five Passengers

A New Advanced Six SEDAN at \$1485

Here's the newest Nash enclosed car conception—large and roomy, swung low on the 121-inch Advanced Six chassis and powered with the big Nash Six motor.

Here is quality of custom-built character; here is beauty that captures your instant admiration; and here is a price that buys you more sheer value than the industry has ever offered in this type of car.

Doors are extra wide; the upholstery is of choice mohair, and there are Nash design four-wheel brakes, full balloon tires, five Budd disc wheels, special Nash easy-steering mechanism and an array of further important attractions.

(999)

THE NASH MOTORS COMPANY, KENOSHA, WIS.



40,000 Miles With Ramcos

~ and Still Going Strong

KOMPETITOR
INNER RINGS

... accurately made of the best quality steel are offered to dealers desiring them. Ramco Cushion Inner Rings, however, are recommended because they are designed and made for the particular piston ring size.

The North End Cleaning and Dyeing Company thought that this car was ready for junking. But the Clarence Ilges Garage at 20th and East Prairie Ave., St. Louis, thought different.

The car not only pumped oil but it had a slap that sounded like the tympani of a symphony orchestra playing Tschaikowsky's "Marche Slav."

RAMCOS were installed. The pumping ceased entirely. The slap was permanently silenced. Forty thousand miles of additional service has been obtained from the truck under constant and trying service. It is working quietly and efficiently today.

RAMCOS alone accomplish such results because they are made to piston ring size of finest Swedish steel under our own specifications. Their hair-like flexibility and heat resisting qualities account for their dominant success.

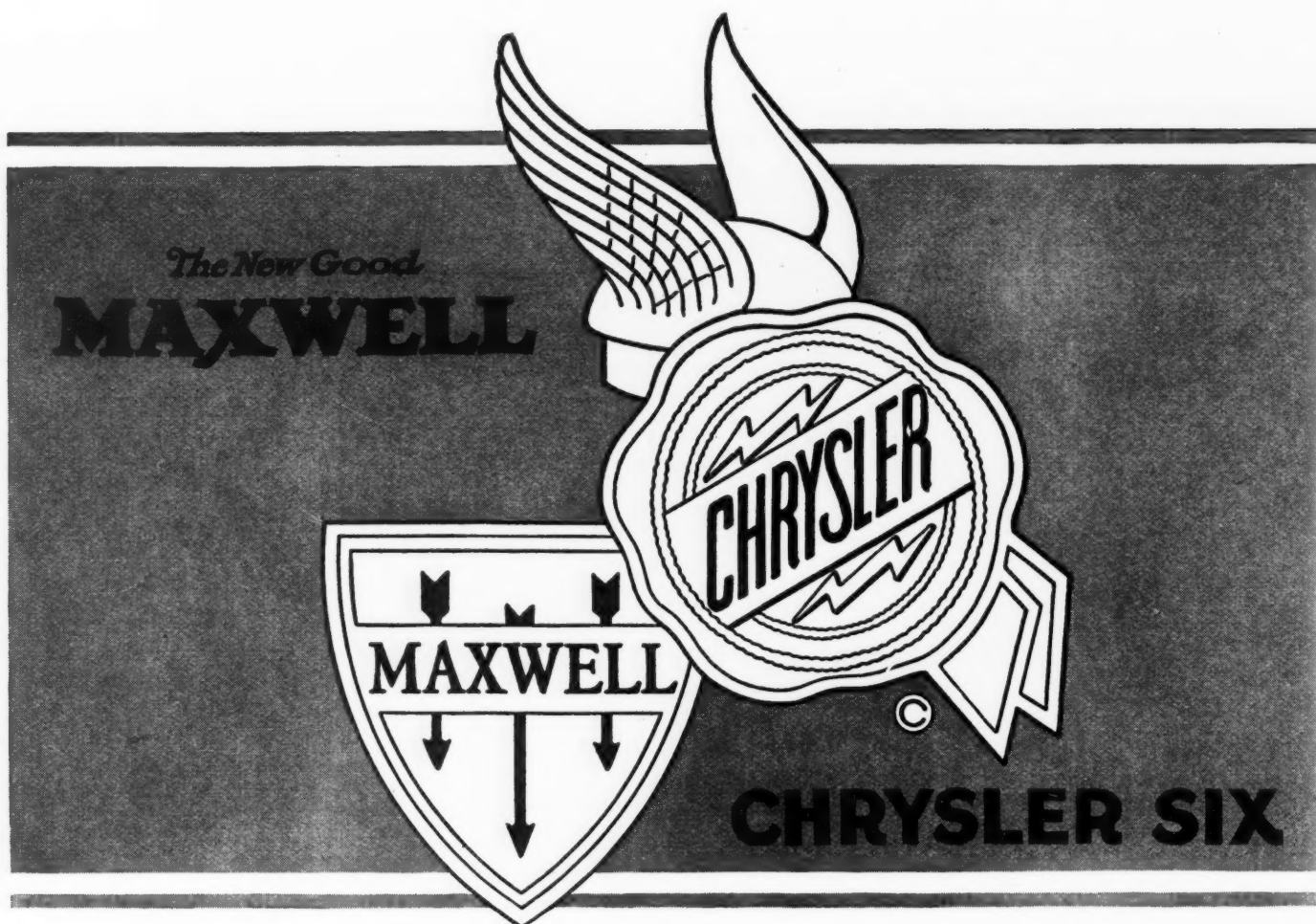
RAMCO

Cushion

INNER RINGS

REG. U. S. PAT. OFF.

RAMSEY ACCESSORIES MANUFACTURING CORP., ST. LOUIS, MO.



The popularity of the famous Chrysler Six was instantaneous and has consistently carried this sensational car to a commanding position in the field of sixes.

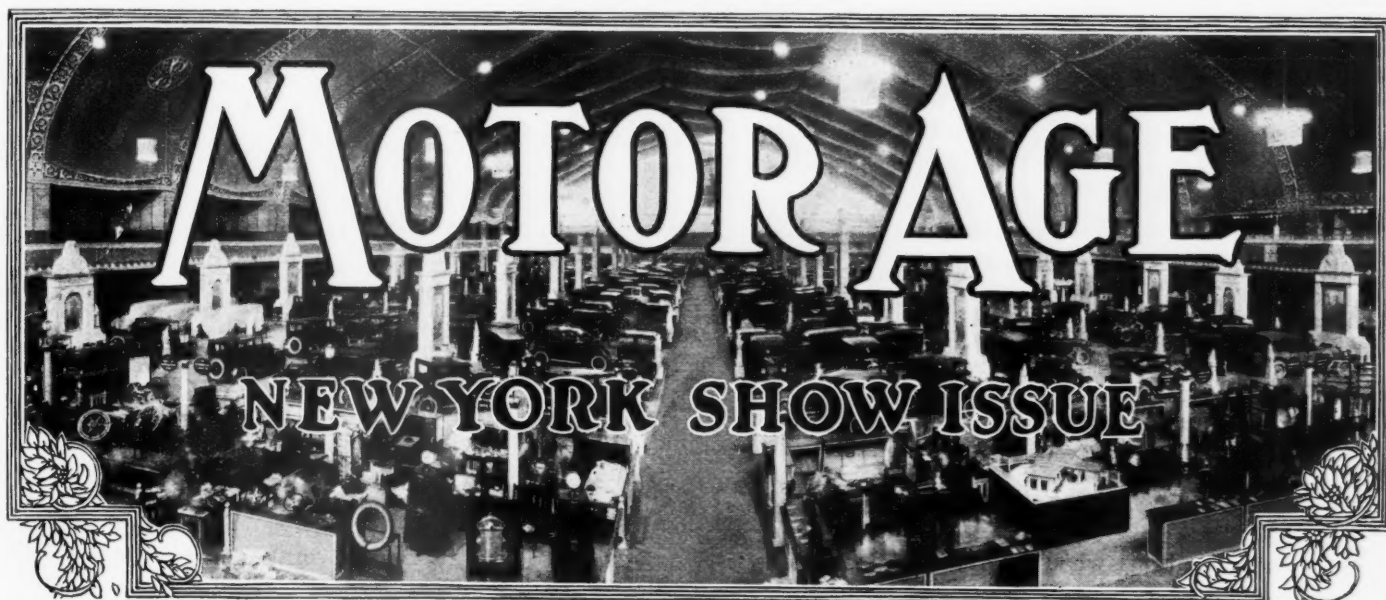
Under the guidance of Chrysler engineers, the new good Maxwell has contributed the greatest advance in four-

cylinder motoring which the industry has encountered in the past five years.

In view of these facts there is every reason to expect that the Maxwell-Chrysler combination will carry away the honors at the national automobile shows as completely as the sensational Chrysler Six did a year ago.

All Maxwell and Chrysler dealers are in position to extend the convenience of time-payments, on a plan that is attractive to the buyer.

MAXWELL MOTOR SALES CORPORATION, DETROIT, MICHIGAN
CHRYSLER MOTOR CORPORATION, DETROIT, MICHIGAN
MAXWELL-CHRYSLER MOTOR COMPANY OF CANADA, LIMITED, WINDSOR, ONTARIO



The Crowning Triumph of National Shows

Silver Anniversary Exhibition in New York Marks Pinnacle of Resplendent Glory Achieved by Automotive Industry in a Quarter Century

By SAM SHELTON

THE glory of 25 years of automobile progress will shine from the Silver Anniversary Show opening in New York City on Friday, January 2.

This is the twenty-fifth year of motor vehicle manufacturing and trading, after the experiments of the closing years of the last century had proved the practicability of the automobile. In these 25 years the automotive industry has become more than a business—it has become a commercial institution that ranks almost with the home and the school in the universality of its relation to human life in America.

This great institution has grown with amazing rapidity to assume a dominant place in the financial, industrial and social life of the United States, but even so its development has been marked from year to year by the national shows conducted in New York and Chicago by the industry's great co-ordinating body—the National Automobile Chamber of Commerce.

At these exhibitions the manufacturers have displayed their latest crea-

tions—some conservatively developed and designed, some radical departures into the field of experiment; some accepted by the public and turned into useful and profitable

articles of commerce, others tried by a few, laughed at and rejected—but always progress toward the good and the beautiful vehicle that is the pride of our industry today.

This show and that which will open three weeks later at Chicago mark the crowning triumph of 25 years of national automobile shows and national automotive progress. And the management now is the same as that which pioneered 25 years ago at Chicago and staged the First National Automobile Show at the Coliseum March 23 to 30, 1901. Managing the first show was Sam A. Miles, prophet and enthusiastic advocate of the automobile, and at that time editor of *MOTOR AGE*. Managing this Silver Anniversary Show and that which is to follow at Chicago, we have the same Sam A. Miles, still prophetic and still the enthusiastic advocate of the automobile, but long since



Charles Clifton, president, National Automobile Chamber of Commerce



Show committee in charge of National Automobile Shows. Left to right—Charles D. Hastings, H. M. Jewett and F. C. Chandler

so occupied with the magnitude of the national shows that these great institutions which he fathered have monopolized his time and talent.

Changes which have occurred in this dynamic industry in the first quarter of this century have been revolutionary. Few names that were prominent then remain to greet one now. Stylish carriages of that day were so crude as compared with the modern vehicle that one is hardly able to recognize them as the forerunners of the improved automobiles of this time. And yet we cannot say that the automobile has been perfected. The men who today control the destiny of the automotive industry are as truly dominated by the pioneering spirit as were those of a quarter century ago. Many of them are the same men, and they are seeking today as they were then ways to make the automobile a more useful and beautiful thing, more easily acquired and more economically maintained.

New Announcements Made

This show, then, although clothed with the grandeur of silver anniversary observance, is, as were all the others—the market place in which manufacturers, dealers and users meet to display, explain and learn about the things that are new. Here as at all the preceding shows we have the announcements of new engines, new body designs, new wheels, new tops, new upholstery, new bumpers, new lamps, new timers and a multitude of new things intended to find a place in the merchandising system of this vast commercial institution.

Some manufacturers are exhibiting at this show new eight-cylinder cars, others new six-cylinder cars and still others new four-cylinder vehicles. They all have their place in the industry. The eights are the latest arrivals in number. Some eights we have had for years, but to this time most of the makers have confined their production to sixes and fours. Now the makers of the fours and sixes are expanding their activity to include the eight with all cylinders in a row, but it is notable that they are not at the same time abandoning the fours and sixes. Let the eights occupy the limelight today; the fours and the sixes are of practical and proved utility and worthy of the keenest intelligence being directed toward their further improvements.

Some points of design applied almost universally to the cars exhibited this

year were considered innovations only a year or two ago. Among these are four-wheel brakes and balloon tires. Balloon tires have been so completely accepted that there is hardly a car to be found upon which they are not provided either as regular or optional equipment. With balloon tires has come a change in steering gear design to make easier the turning of front wheels having greater frictional contact with the road.

The cars of this year are made lower. By improved body engineering the center of gravity has been brought nearer the road, adding to both the appearance of the vehicle and its riding qualities.

Cars Are Made Lower

A distinct development of this year, emphasized strongly at the show, is the general adoption of the coach type of enclosed car. One manufacturer has pioneered along this line for several years, but not until in the last six months of 1924 did the makers turn generally to this economical and convenient construction. The result is several enclosed models priced at or below the price of the open car of the same make and equal passenger capacity.

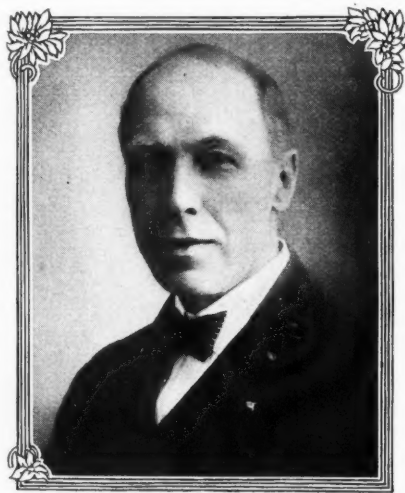
The strong preference of the public for the enclosed car is so pronounced at this show that it would seem there would no longer be reason for holding enclosed car shows as distinguished from a general show—a practice that for some years has prevailed in a number of cities.

Much of the progress of the last year has been measured in improvement of body design and finish. The extent to which nitro-cellulose paints have been adopted has resulted in both lower cost and more pleasing appearance of the vehicle. The new finish also is expected to materially reduce the maintenance cost of the automobile because of its lasting quality and the ease with which it may be cleaned.

First Two Days for Trade

At the same time the industry has departed far from the conventional and somber black that once was the standard finish of practically every car. At New York color that is cheerful, but not gaudy prevails. The soft tones of green, blue, grey, brown, are much in evidence, according to advance study of the specifications of cars entered. Two tones often are used in finishing the enclosed cars, the separation being by moldings at the belt line.

The show this year assumes its rightful sphere of importance to the trade through the adoption of the plan



Sam A. Miles, manager National Automobile Shows

to have it open to the trade exclusively on the first two days—Friday and Saturday. Heretofore the national shows have opened on Saturday, the public being admitted from the first and up to the very last. This year the opening day is moved up to Friday for the trade and the public will be admitted for the first time on Saturday evening. This will afford a splendid opportunity for dealers, distributors and factory men to get together and talk business. It will enable them to examine the complete display of cars, parts and accessories at leisure and without confusion that goes with public attendance.

Admission of the trade on these two days will be without charge. Tickets have been widely distributed by the management through the industry, but the point is emphasized that any bona fide member of the trade, whether possessing a ticket or not, will be admitted upon identifying himself at the gate. The management hopes through this feature to make the shows this year of greater value to the whole industry. Whether or not it succeeds in this depends a great deal upon the attendance by dealers, distributors, and factory representatives.

1924 Production Less

The show this year again calls attention emphatically to the gradual concentration of automobile production. In the 1924 show there were 73 makes of cars and taxicabs exhibited. The number in this show is 58. The number of car exhibitors has gone lower steadily for some years, having been 87 in 1922, and yet the show has grown in space requirements until last year

it was found necessary to move from the Grand Central Palace to the 258th Field Artillery Armory, in the Bronx, where a vast expense of space on one floor was available. This greater demand for space is due partly to the greater area needed to display the varied body styles comprising the lines of the leading manufacturers and to the requirements of the great number of important makers of parts and accessories who find in this show an unequal opportunity to present their merchandise to all the trade.

Meanwhile production of automobiles has grown almost without interruption. From a total of 3,700 cars and trucks in 1899 the industry has advanced until the high mark was reached in 1923 with a total of 4,086,997 vehicles. This year the number will be somewhat less, the figure up to the end of November being 3,368,632 cars and trucks. Production for December should bring this to something more than 3,500,00.

There will be many gatherings of automotive men in New York during the week of the show. Manufacturers will entertain their distributors and dealers. The N. A. C. C. will hold its annual banquet; likewise the Motor and Accessory Manufacturers' Association. The National Automobile Dealers' Association will hold a meeting for eastern dealers, but the annual convention of that organization will be held at Chicago the week of the Chicago Silver Anniversary Show.

The first of the Silver Anniversary Shows, opening in New York the day after New Year's, bids fair to be the

(Continued on Page 18)



Alfred Reeves, general manager, National Automobile Chamber of Commerce

Passenger Car and Taxicab Exhibits at the Silver Anniversary Show, New York, Jan. 2-10, 1925

PASSENGER CARS

NAME	MANUFACTURER
Ambassador.....	Yellow Cab Mfg. Co., Chicago, Ill.
Apperson.....	Apperson Bros. Automobile Co., Kokomo, Ind.
Auburn.....	Auburn Automobile Co., Auburn, Ind.
Buick.....	Buick Motor Co., Flint, Mich.
Cadillac.....	Cadillac Motor Car Co., Detroit, Mich.
Case.....	J. I. Case T. M. Co., Racine, Wis.
Chandler.....	Chandler Motor Car Co., Cleveland, O.
Chevrolet.....	Chevrolet Motor Co., Detroit, Mich.
Chrysler.....	Chrysler Motor Corp., Detroit, Mich.
Cleveland.....	Cleveland Automobile Co., Cleveland, O.
Cole.....	Cole Motor Car Co., Indianapolis, Ind.
Davis.....	George W. Davis Motor Car Co., Richmond, Ind.
Dodge Brothers.....	Dodge Brothers, Inc., Detroit, Mich.
Du Pont.....	Du Pont Motors, Inc., Moore, Pa.
Durant.....	Durant Motors, Inc., New York City, N. Y.
Elcar.....	Elcar Motor Co., Elkhart, Ind.
Essex.....	Essex Motors, Detroit, Mich.
Flint.....	Flint Motor Co., Flint, Mich.
Franklin.....	H. H. Franklin Mfg. Co., Syracuse, N. Y.
Gardner.....	Gardner Motor Co., Inc., St. Louis, Mo.
Gray.....	Gray Motor Corp., Detroit, Mich.
Haynes.....	Haynes Automobile Co., Kokomo, Ind.
Hudson.....	Hudson Motor Car Co., Detroit, Mich.
Hupmobile.....	Hupp Motor Car Co., Detroit, Mich.
Jewett.....	Paige-Detroit Motor Car Co., Detroit.
Jordan.....	Jordan Motor Car Co., Cleveland, O.
Kissel.....	Kissel Motor Car Co., Hartford, Wis.
Lexington.....	Lexington Motor Co., Connersville, Ind.
Lincoln.....	Ford Motor Co., Detroit, Mich.
Locomobile.....	Locomobile Co. of America, Inc., Bridgeport, Conn.
McFarlan.....	McFarlan Motor Corp., Connersville, Ind.

NAME

MANUFACTURER

Marmon.....	Nordyke and Marmon Co., Indianapolis, Ind.
Maxwell.....	Maxwell Motor Sales Corp., Detroit, Mich.
Mercer.....	Mercer Motor Car Co., Trenton, N. J.
Moon.....	Moon Motor Car Co., St. Louis, Mo.
Nash.....	Nash Motors Co., Kenosha, Wis.
Oakland.....	Oakland Motor Car Co., Pontiac, Mich.
Oldsmobile.....	Olds Motor Works, Lansing, Mich.
Overland.....	Willys-Overland, Inc., Toledo, Ohio.
Packard.....	Packard Motor Car Co., Detroit, Mich.
Paige.....	Paige-Detroit Motor Car Co., Detroit.
Peerless.....	Peerless Motor Car Co., Cleveland, O.
Pierce-Arrow.....	Pierce-Arrow Motor Car Co., Buffalo, N. Y.
Reo.....	Reo Motor Car Co., Lansing, Mich.
Rickenbacker.....	Rickenbacker Motor Co., Detroit, Mich.
Rollin.....	Rollin Motors, Inc., Cleveland, O.
Star.....	Durant Motors, Inc., New York, N. Y.
Stanley.....	Steam Vehicle Corp. of America, Newton, Mass.
Stearns.....	F. B. Stearns Co., Cleveland, O.
Studebaker.....	Studebaker Corp. of America, South Bend, Ind.
Stutz.....	Stutz Motor Car Co. of America, Inc., Indianapolis, Ind.
Velle.....	Velle Motors Corp., Moline, Ill.
Westcott.....	Westcott Motor Car Co., Springfield, O.
Wills Ste. Claire.....	Wills Ste. Claire, Inc., Marysville, Mich.
Willys-Knight.....	Willys-Overland, Inc., Toledo, O.

TAXICABS

Checker.....	Checker Cab Mfg. Co., Kalamazoo, Mich.
H. C. S.....	H. C. S. Cab Mfg. Co., Indianapolis, Ind.
Premier.....	Premier Motors, Inc., Indianapolis, Ind.
Reo.....	Reo Motor Car Co., Lansing, Mich.
Yellow.....	Yellow Cab Mfg. Co., Chicago, Ill.

ACCESSORY AND MISCELLANEOUS EXHIBITORS

Passenger car and
taxicab exhibitors
on preceding page

New York Silver Anniversary Show

Jan. 2-10, 1925

This list complete
only up to time
of going to press

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Progress in the Standardization of Maintenance

This Phase of the Industry Has Been Put on a Par With Production and Selling by Most Makers. Competition in Repair Operation Prices Accelerates Good Engine and Chassis Design. Tool Equipment Makes Possible Low Maintenance Operation Costs to Customer

By B. M. IKERT

WITH engineering, production and and merchandising methods of motor vehicles more or less standardized and carried along on certain well established lines, the automotive industry during the last year or so has put forth a similar effort to standardize maintenance and service, thereby establishing a code of ethics, as it were, by which such service might adequately be measured.

All along the line there is ample proof that maintenance and service are being given as much, if indeed, not more attention than design and production. Design has not changed much during the last few years, nor even production and while of late there has been quite a leaning towards straight eight engines the fact remains that the mere addition of cylinders does not change the design of the engine fundamentally. It merely adds parts.

Thus, in the new Rickenbacker Vertical Eight and six-cylinder engine there are many parts common to both which not only makes production more economical but has direct and valuable bearing on the servicing of these two units, both from a factory and dealer standpoint. Many other makers producing more than one kind of car are doubling up in the same way.

Reason is Apparent

We have not far to look for what appears at least to be an excellent reason for this standardization in models—maintenance. Most car manufacturers openly admit this. No one will deny that the twelve-cylinder cars of a few years ago were excellent performers so far as operation was concerned, but all you have to do is mention them to a service man and he thanks his lucky stars that he does not have to work on these jobs anymore. The engines were hard to get at, so hard, in fact, that some of the ordinary adjustments and repairs were neglected. Then, when a complete overhaul was necessary and the customer got the bill he either died from shock right on the spot or left the car as part payment.

Seriously speaking maintenance has progressed to the extent where it is a potent factor in the very evolution of new designs on the drawing boards of our factories. This first took root a few years ago when the motor car ceased to be a luxury and became a necessary means of transportation. During this

transition period the service department of the factory ceased to be merely a parts distribution center. The "kicks" from angry dealers and service men in the field were carefully analyzed by the service department in factories and presented in concrete form to the engineering department.

The ultimate consumer—the car-buying public—became motorwise and started to ask to the car dealer, not about the oiling system, the wheelbase or make of axles, but "How much is it going to cost me to run this car?" Maintenance again.

The fellow who coined the phrase "It's

Outstanding Features in the Standardization of Maintenance

Better design, materials, production methods and workmanship have joined hands in building service ability into present day motor vehicles.

Engineers are able to control expansions of various metals and practically all of the former trouble the service man encountered with warping blocks and poorly fitted pistons has been overcome.

The straight eight engine aside from a performance standpoint is one of the most accessible engines we have today. The added cylinders mean only a few extra parts and the service work on this type of engine is not much different from that of the six.

Competition in repair prices has accelerated better design and the result is that our cars and engines today are probably the easiest ones to work upon the industry has as yet offered.

Practically every factory making cars in large volume has worked out a flat rate system for their dealers and service stations, in order to standardize so far as possible prices for the various service operations.

Too much emphasis cannot be placed on the importance of tools and equipment in the standardization of maintenance. Factories have brought out special tools to service their cars and to get repair prices down to a minimum.

Dealer helps such as service bulletins, service manuals, etc., are constantly being brought out and revised by the factories, in order that the maintenance end of the industry may have the last word as to the approved methods and equipment.

not the original cost, but the upkeep," certainly thought along maintenance lines. It's the cost of transportation in which the car buying public is interested and in which it has become motorwise. Not so much in how many miles to a gallon or set of tires, but in how much it costs to grind the valves and keep the mechanical units functioning correctly to get uninterrupted service from the car.

Competition in the prices of repairs has brought out better designs of engines and chassis in general. Obviously if it cost one car owner \$10 for a certain repair job and cost his neighbor \$15 for the same job they begin to swap stories about the relative accessibility of their cars. The neighbor scratches his head and wonders why the extra \$5 on his car. Perhaps he finds out from a repairman or dealer that it takes longer to do the job on his particular make of car and hence the extra five. But, the next time he buys a car the chances are ten to one he asks the dealer all about how long it takes to do such jobs on this car and what it will cost. And from this point we have the beginning of the flat rate era and its effect on the standardization of maintenance.

Service Costs Decreased

There can be no question but what the flat rate system of handling service and repair operations has given us not only engines and cars that are more accessible thereby decreasing service costs, but has had its influencing effect on the design and materials which go into the modern motor vehicle.

Take the straight eight engine, for example. Generally speaking all of the eights of this type made in the United States are very accessible. The blocks are clean cut and simple in design. Heads are detachable and their removal means only a slight amount of additional work, principally taking off a half dozen or so more nuts, as compared to a six. The manifolds are easy to get at, also the carburetor, starting motor, generator, ignition unit, water pump, etc. A typical straight eight engine is shown herewith and other views of some of the new straight eights are shown in connection with the description of new cars starting on page 33.

While it might be said that the basis of appeal for the straight eight is better performance for the car owner, it is equally true that the car owner does not want this performance at the sacrifice of low maintenance cost. He may stand for

a little more complication of the units to get this added performance, but along with it must come nominal prices for at least the common service operations.

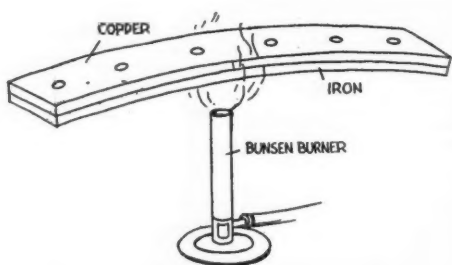
Materials have made it possible to progress in the standardization of maintenance. A more practical application of the common laws of physics and chemistry has taken away to a large extent the things which formerly worried the maintenance man and over which he had little or no control.

Take the subject of expansion. We know from our study of physics that if a piece of copper and iron are riveted together and heated over a flame, the two pieces will bond slightly, with the copper on the convex side. This merely shows that copper expands more than iron when heated and, therefore, if we build anything out of these two metals that is to be subjected to heat, we must consider this difference in expansion or there is going to be trouble.

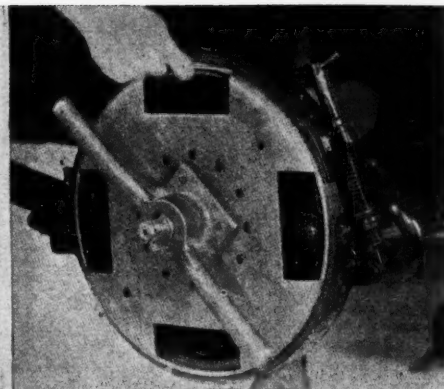
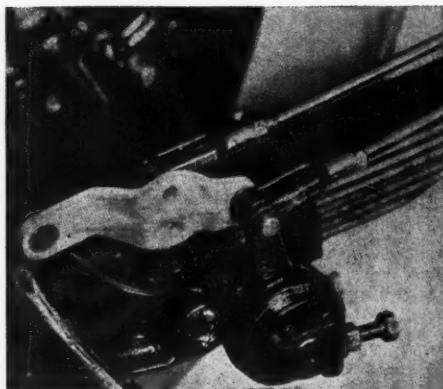
Thus it is easy to see some of the problems the engine builder is up against when he combines iron and steel with aluminum or other alloys in his engines. But the engine builders know a great deal more about "thermal expansivity" as they call it and even with long cylinder blocks and heads there is practically no trouble to speak of from the parts warping out of shape and causing the service man an endless amount of grief.

While on this subject it may not be amiss to mention the novel means of holding down the cylinder head on one of the new sixes just announced. In this design the studs are in the head and pass through holes in lugs formed on the outer side of the water jacket. Suitable recesses are made in the outside of the block so nuts can be turned on the studs. The thought behind this construction is that the studs being on the water jacket are not subjected to strains as they might be if placed conventionally near the combustion chambers.

Practically all of the factories producing cars in volume have worked out some sort of flat rate system for their dealers in order to get their service and maintenance on a standardized basis all over the country. And in this the service



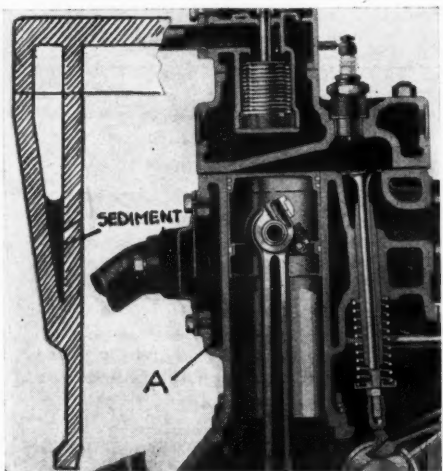
Illustrating the different expansion of metals when heated. When a piece of copper and iron are riveted together and heated they form a curve, showing that the metals do not expand alike. The copper piece is on the convex side, showing it has a greater expansion than iron. In a way this illustrates some of the problems engine designers and builders must cope with when using various different materials in building an engine



Two devices which one car maker uses to hasten service operations and insure correct results. One is a brake band test gage built with a standard drum fitted with a dummy hub. This tool cuts down the time of adjusting the brakes after relining. The other tool is a brake lever gage which enables the mechanic to quickly locate the position of the brake lever

engineer at the factory has had an important part.

While the service engineer does not as a rule have much to say about the final points of design he is often given the chance to go over the layout before the



Sectional view of one of the newer engines, showing how water passages at A have been made large enough to prevent sediment depositing itself and thereby, interfering with the proper cooling. In previous engines, heating was sometimes caused by the water jackets filling up due to being wedge-shaped, as shown in the sketch

car actually is in production. This is done to get the "bugs" out of the car so it will be easy to work upon and thereby make possible low cost of repair operations.

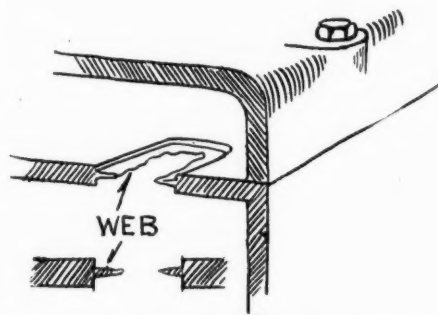
To show how this works out. A maker was prepared to turn out a car in which there were two bolts used on the lower part of the front timing chain cover which it attaches to the flange on the crank case. The bolts were put in from the top and it was quite a job to get the nuts on and off. The service engineer's crew found this out while performing service and repair jobs on the car and before the car was in production the two bolts had been replaced with cap screws which easily could be placed into position from the top and tightened with a socket wrench. All this for maintenance sake.

The above may seem a trifle, but attention to many just such things has made possible getting some of our new cars down on a basis where nearly all the maintenance operations are easy to perform.

The factories for the most part are constantly revising certain constructions on their cars to facilitate maintenance and to lower existing costs, so far as possible, of their present flat rate prices for repairs.

At this point it is well to recall that a few years ago there were no such things as special tools and equipment furnished by the factories in order that its dealers might work to best advantage in the servicing of motor cars. But, in these changing times the factories realize the importance of working with the dealers on their service problems.

One maker of a relatively high priced car has, for example, brought out a small cabinet equipped with all the necessary items for a mechanic to perform the job of removing the head, grinding the valves, cleaning carbon, tuning the engine, etc. The mechanic does not have to leave the job from the time he starts until he leaves, as everything he can possibly need is in the cabinet, even to the bucket for draining the water. The use of this cabinet has cut down the time for this job so materially that the dealers for this car can set a flat price for the job below that of the independent repairman, unless the latter is similarly equipped.



Much has been accomplished in the way of getting better water passages in cylinder blocks and it is rare to find a case of a web left in the water passages to restrict the flow and thereby cause overheating

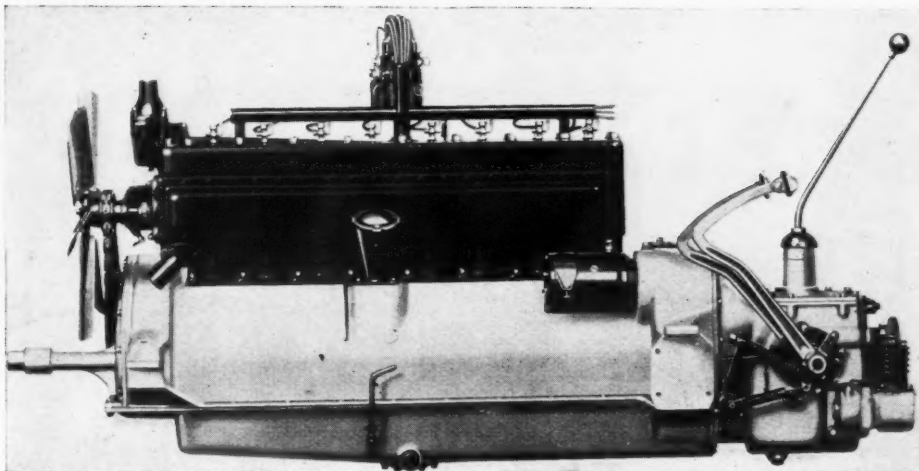
Selling maintenance work by the job and not by the hour has resulted in all sorts of time-savers for the shop. These devices are of such a nature that the mechanic cannot go wrong. Two typical devices of this kind are shown on these pages. A good many of the special tools and equipment to fit certain makes of cars can be had on the open market and this fact naturally has made possible some of the standardization of maintenance because the independent repairman has access to them as well as the dealer's service department. Hence we find both charging the same flat rate for the job and our neighbor ceases to scratch his head about the extra \$5.

There is an almost endless variety of shop equipment to be had for those engaged in maintenance work and it can truthfully be said that without equipment the rapid strides in the standardization of repair prices would not have been possible.

Almost without exception every factory now furnishes some sort of help to its dealers and service stations as regards maintenance and repair operations on the car it builds. Years ago the instruction book written by someone at the factory or by some advertising agency miles away from where the cars were built was all the service help that either the dealer, service station or car owner could get.

Must Furnish Information

These books often were totally lacking so far as information of any value was concerned. Repair men who worked on the cars had to rely upon their own ingenuity and such things as clearances and tolerance of bearings, gears, etc., were tightly locked up in the safes at the factories. They were great secrets



One of the outstanding features of the straight eight engine is its accessibility. In fact, several of the car makers using this type of engine openly admit its service and maintenance had a great deal to do with the adoption of this powerplant. Like a four or six-cylinder, the straight eight has a single block and head, one exhaust manifold, one intake manifold, a single water pump and similar units

to be known only to the czars of the them duplicate, so far as possible, factory conditions on a repair job. A repairman must know if an engine builder allows .003 or .005 in. on a certain bearing and just as the factory mechanic must have his blueprint of tolerances and clearances, so must the mechanic in the field also have his blueprint. Otherwise a repair job will not even approximate the factory job.

True, it sometimes happens that the small shop does even a better job than engineering department. "Why let the grease hounds in the small towns know about them" was their attitude.

But things have changed and car makers know that in order to have their cars operating at maximum effi-

ciency they must furnish their dealers and service men with information to help the original factory job, but such shops are not the rule and the factory which is careless in the design and construction of its product, is on the wane in these days of keen competition.

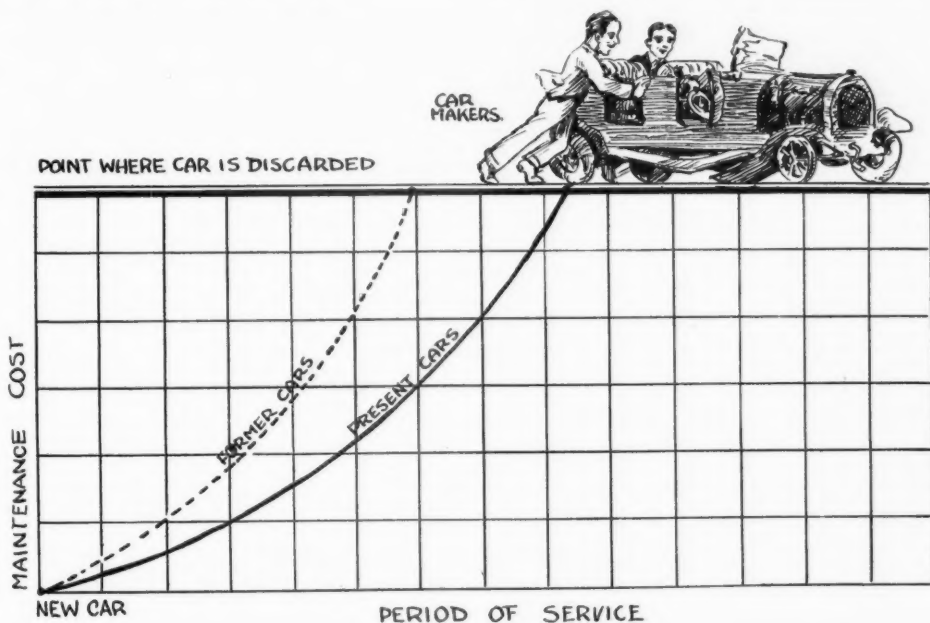
Dealer Helps Furnished

Most factories today are literally pouring out all kinds of dealer help in the way of service information. On one of these pages is shown one of a series of charts, which one factory has prepared for its service stations. These charts are very complete and go into the smallest detail. They tell a mechanic exactly how to proceed on a job from start to finish. They tell him the tools to use and the amount of clearance necessary wherever parts have to be closely fitted or adjustments have to be made. Illustrations help to make all this clear and some of our factories are to be complimented upon the excellent manner in which they present these service helps, to their dealers and service stations.

In order to standardize service and maintenance, it is quite common now for factories to conduct classes for their dealers and service men, in order that the latter might know of the approved methods and equipment to follow out the flat rate schedules compiled by the factory. Whenever a new model is brought out it is customary for the factory to send out invitations to its dealers to come to the factory in order that the car might be explained to them from both a selling and service standpoint. Usually all of the service operations are performed and in this equipment and tools are used which speed up the work and insure correct results.

Work With Equipment Makers

Factories have done a great deal of work in the preparation of service manuals and service bulletins, covering the various operations on their cars. These bulletins are constantly revised when changes are made in the car or when the

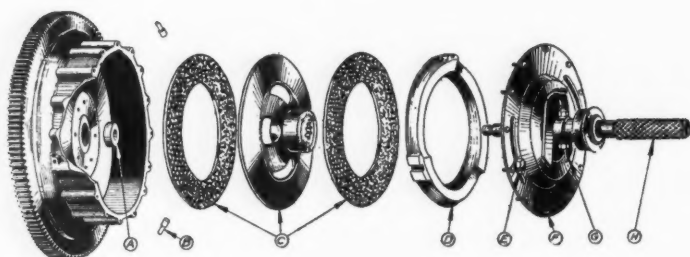


The point at which motor vehicles are discarded, when the cost of maintenance is excessive and the vehicles are no longer dependable—has been pushed ahead considerably by the car manufacturers. This chart shows as nearly as it is possible to do so, that with the same maintenance cost we get a longer period of service from our present day cars. Better service facilities on the part of car maker, dealer and independent repair shops have contributed to this in addition to the progress made in design, development of materials and production methods

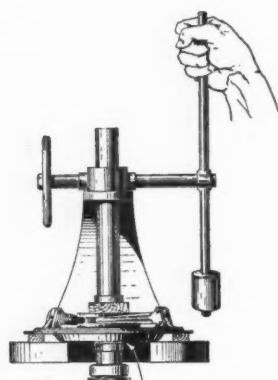
- TO ASSEMBLE CLUTCH**
- 1-INSTALL BRONZE BUSHING "A" IN FLYWHEEL
 - 2-PLACE FRICTION PLATE ASSEMBLY "C" IN POSITION AND INSTALL DOWEL PINS "B"
 - 3-PLACE ADJUSTING RING "D" IN POSITION
 - 4-INSERT ALIGNING BAR "H" (DRAWING NO.29053) IN CLUTCH COVER ASSEMBLY (U-PIECE HAVING BEEN PREVIOUSLY INSERTED WITH THE AID OF ARBOR PRESS AS SHOWN)
 - 5-PLACE CLUTCH COVER ASSEMBLY IN POSITION, MAKING SURE ALIGNING BAR "H" ENTERS BUSHING "A"
 - 6-INSERT CLUTCH COVER SCREWS "F"
 - 7-REMOVE U-PIECE "G"
 - 8-REMOVE ALIGNING BAR "H" (BE SURE NEVER TO REMOVE ALIGNING BAR UNTIL AFTER U-PIECE HAS BEEN REMOVED)

- TO DISMANTLE CLUTCH**
- 1-DEPRESS CLUTCH PEDAL AND INSERT U-PIECE "G" IN POSITION AS SHOWN BELOW
 - 2-REMOVE TRANSMISSION ASSEMBLY COMPLETE
 - 3-REMOVE CLUTCH COVER ASSEMBLY (IT IS NOT NECESSARY TO LOOSEN ADJUSTING SCREWS "F")
 - 4-REMOVE CLUTCH ADJUSTING RING "D"
 - 5-DRIVE OUT DOWEL PINS "B"
 - 6-REMOVE CLUTCH PLATE ASSEMBLY "C"

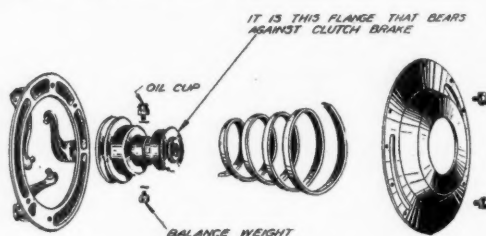
TO ADJUST CLUTCH
SEE INSTRUCTION CHART 726



- A - BRONZE BUSHING
B - DOWEL PINS
C - CLUTCH PLATE ASSEMBLY (RIVETED TOGETHER)
D - ADJUSTING RING
E - ADJUSTING SCREWS
F - CLUTCH COVER SCREWS
G - U-PIECE (DRAWING NO.29144)
H - ALIGNING BAR (DRAWING NO.29053)



METHOD OF REMOVING U-PIECE (DRAWING NO.29144) WHEN SEPARATING CLUTCH COVER AND CLUTCH TRUNNION (USE SAME METHOD TO INSERT U-PIECE BEFORE ASSEMBLING CLUTCH)



CLUTCH COVER DETAILS



CLUTCH TRUNNION DETAILS

How the factory co-operates with dealers and service stations on the performance of maintenance operations. Above is shown a sample chart as prepared by one factory for its service stations. In addition to showing the manner in which repairs and adjustments are carried out, the tools used, etc., many of these charts specify the clearances and tolerances necessary. In this way they are to the service man what the blueprints are to the factory mechanic

time on the operation is materially reduced. Every factory which has brought out a flat rate system keeps a crew of men busy at the factory in a constant effort to simplify these flat rate operations and pass the short cuts on to the dealers and service stations.

In this latter work new equipment suggests itself and while the factory, making motor cars, does not care, as a rule, to go into the manufacture of special tools to service its cars, it does work very closely with the equipment manufacturers, so that jointly the market affords service station equipment designed to meet the needs of practically every make of car. Much of this equipment, of course, is universal in character and can be used to advantage on practically all makes of cars.

TO OPERATE BODY PLANT

WATERLOO, N. Y., Dec. 27.—The Waterloo Bodies, Inc., has been organized to succeed the Waterloo Body Corporation following approval by the courts of the receiver's sale of the plant, equipment and other assets to Frederick G. Stewart. Mr. Stewart's bid was \$44,000. Incorporation papers of the new concern have been filed. Directors are: Frederick G. Stewart, Waterloo; E. G. Sheriff, Williamsport, Pa.; E. J. Chestnut, Buffalo; Leonard S. Zartman, Almon H. Traphagen, Charles H. Pratz, John E. Becker, Fred G. Smith, Harry W. LeClearn and John Knopf, all of Waterloo.

It is expected the plant will resume work with a full force within a few weeks.

DAN'S DIARY

Jan. 1.—Gee! I don't no but what me and Art is making a big mistake going into the automobile repair bizness. I was reading in the paper the other day that they was over 125 guys that flu their own airryplanes to this here Pulitzer race and Air Meet at Dayton. If they is that many guys with airryplanes that can leve their jobs and go to a show like that they must be a lot more than cant and altogether they is a bunch of ships flying around than most folks dont no nothing about.

But gosh! if a fellow was to start an airryplane garage it would half to be bigger than the dickens and he would half to have a landing field and about 50 acres wouldnt be to much and then probably some of them careless drivers would bump into the gas pump or the side of the building and bust things all up before they would stop.

This paper says they is some guys going



to bild 200 yellow air cabs which will cary 4 passengers for 20 sents a mile each. If yellow air cabs gets as thick as yellow taxi-cabs was in Chicago when i was over there a wild goose going south would be out of luck to doge them.

Anyhow when me and Art gets started if we have some spare time we could build one of them fliver planes they tawk about out of a motor cycle engine and have some fun and also get some advertising which we could paint signs on the under side of the wings and tell everybody all about it. They would be a lot more advertising in one of them than they is to one of them fents busting Ford racers everyone is trying to bild.

Then if all of them sports get to flying around in their own ships, me and Art could put on our sunday close and flit over to Jonesville jest like any of them.

MITCHELL CREDITORS MAY SHARE

MILWAUKEE, Dec. 29.—Creditors of the old Mitchell Motors Co. of Racine, Wis., may realize 20 per cent of their claims if the courts uphold two rulings made by Milton J. Knoblock, referee in bankruptcy, respecting government claims on war contracts.

The government claimed \$475,000, alleged to have been improperly paid to Mitchell on war contracts and bonuses on motor trucks for the army, and the referee rules that this claim should properly be audited at only \$103,662.

The second ruling is that the government is not entitled to priority in its claims, except for taxes.

Claims against the Mitchell company aggregate about \$3,900,000, while Herbert F. Johnson, trustee, has on hand, available for distribution in dividends, a little more than \$1,000,000. Stockholders have abandoned hopes of any realization.

The CARS of 1925

*A Glimpse at the Latest Models Entered
in the Silver Anniversary Show at
New York Jan. 2-10*



The Crowning Triumph of National Shows

(Continued from Page 11)

greatest trade event in the history of the industry and to forecast in its resplendent glory the opening of another quarter century of growth and service by a great industry for all the people of the United States and the world.

Following the close of the New York show the N. A. C. C. show management will move its headquarters to Chicago to prepare for the Silver Anniversary show in that city which opens Jan. 23. The Chicago show will be held under one roof the first time in many years. Thanks to the completion of North Hall, an addition to the Coliseum, it is possible this year to house all the exhibits in the Coliseum and its two wings and the Greer building, adjoining the Coliseum group on the south. The car and taxicab exhibits will occupy the main floor of the Coliseum halls, and accessories,

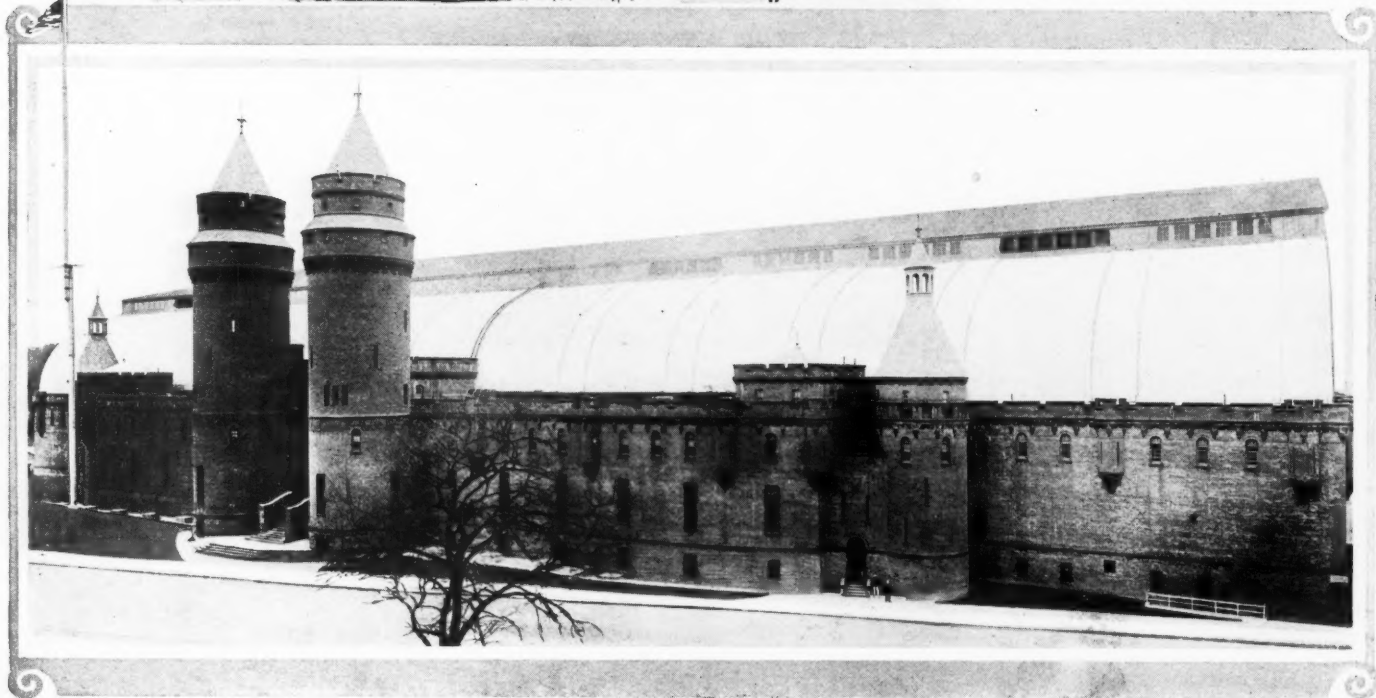
Below: 258th Field Artillery Armory where New York Show is held; at left: artist's conception of silver tower commemorating twenty-fifth anniversary of the industry.

PHOTOGRAPHS OF LATEST MODELS

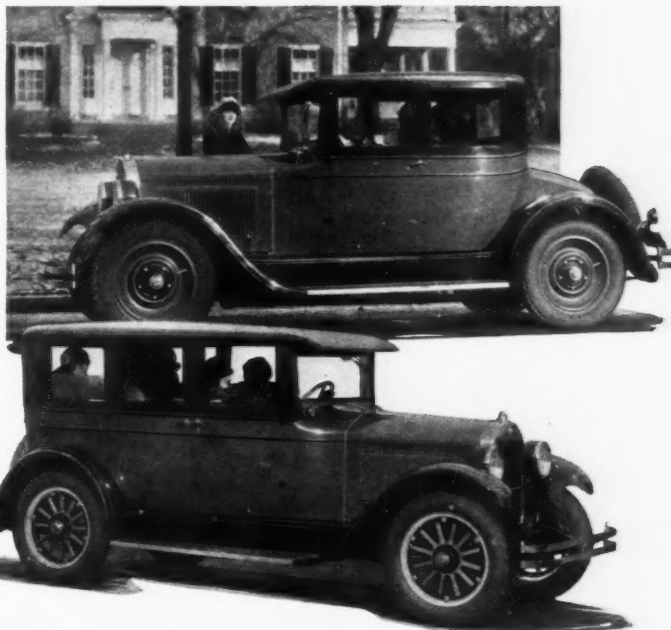
ON the following pages **MOTOR AGE** presents photographic illustrations of practically all makes of cars entered in the New York Silver Anniversary Show. Wherever possible the photographs show one or more of the latest models of the respective manufacturers. Here are illustrated some of the new designs that are revealed to the public for the first time at this show. In all cases the latest available photographs were used. In one or two cases it was not possible to obtain a suitable photograph in time to use in this issue. On the pages that follow this picture section appear detailed descriptions of new models.

parts and equipment will be in the Greer building and the Coliseum galleries.

The selling season for 1925 may be said to have already opened. The buyer's argument in favor of delaying purchase until spring because he could not use the car in the winter is now gone because the industry has met the situation and provides a comfortable enclosed car at open-car price. There is now every reason why the prospective purchaser should buy his car at once and enjoy the comfortable utility it will provide for him during the disagreeable weather of the late winter and early spring.

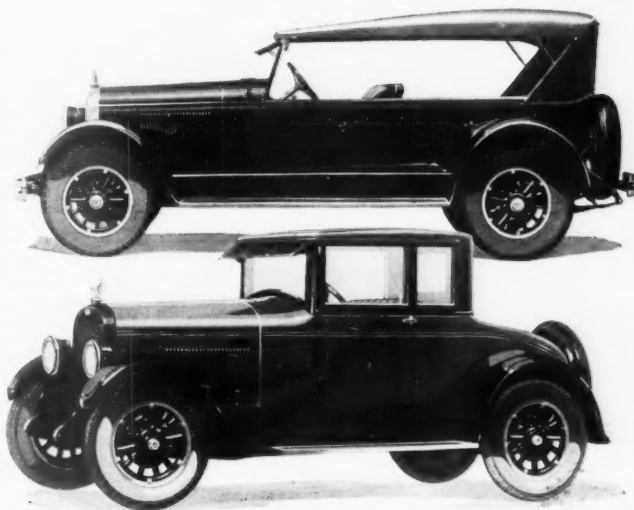


HUPMOBILE. The Hupmobile eight-in-line makes its initial appearance at the New York Show. In this new car the engineer sees points of design, indicating the best in our present day engineering practice, the heavy crankshaft, the duralumin rods, pointing to inbuilt durability. The more casual observer sees the outward features, the blending of top and sunshield in the closed models, the Duco finish, the belt line molding accentuating the effect of length. The engine develops over 60 H.P. at 2700 R.P.M., reflecting racing car construction in its relatively high compression of 85 lbs. at 1000 R.P.M., the point of greatest torque. Hydraulic four wheel brakes and 33 by 6 in. six ply balloon tires are regular equipment. Extreme angle at which the front wheels may be turned gives the car a 19 ft. turning radius. Ross cam and lever type steering gear having a 2.5 to 1 ratio is used. Ample starting ability is insured with a 155 amp. hr. battery. The 4 Passenger coupe and 5 Passenger sedan here illustrated list at \$2325 and \$2375 respectively.



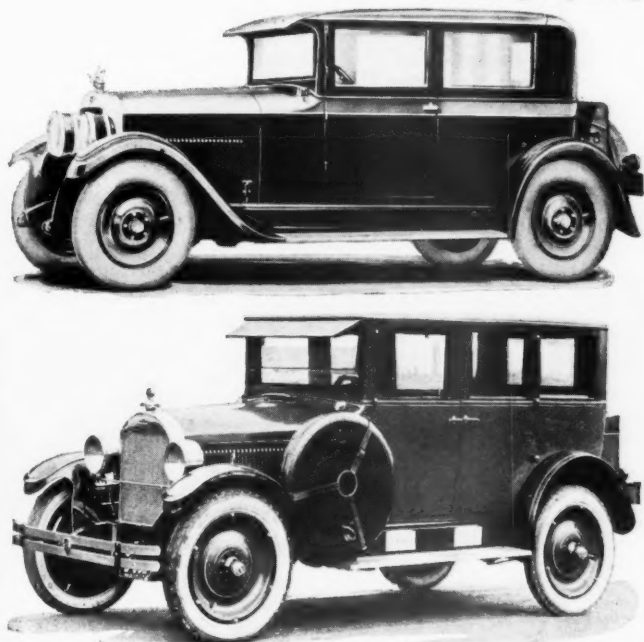
Above—Hupmobile eight-in-line Coupe; below—Hupmobile Sedan on same chassis

PAIGE. Balloon tires and de luxe accessory equipment characterize the Paige line for 1925, the prices being raised \$70. The 7 passenger Phaeton illustrated now sells for \$2165. Hydraulic brakes are furnished at an extra charge of \$45. The engine now has a larger water pump and thermostat, while the plain fan bearing has been replaced with an annular ball bearing. Front axle is heavier to stand the braking strain at front wheels. The Brougham is equipped with Hartford shock absorbers while Gabriel Snubbers are used on all other models.



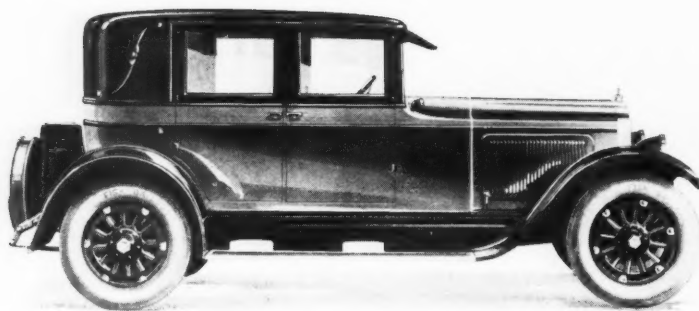
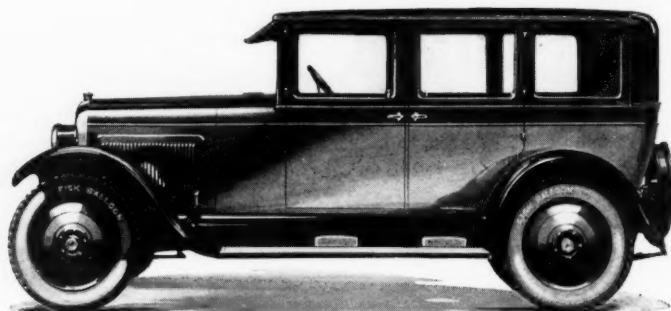
Above—Paige 7-passenger Phaeton; below—Jewett Coupe

JEWETT. The Jewett cars being exhibited indicate a revision in the line to facilitate service, while the bodies have also been redesigned. Engine changes include stiffer crankshaft, replaceable bearings and skeleton type pistons. A counterweighted crankshaft, balanced dynamically, insures smooth operation. A worm and sector type steering gear is now used, with larger reduction, to facilitate operation with balloon tire equipment. The Jewett Coupe illustrated sells for \$1310.



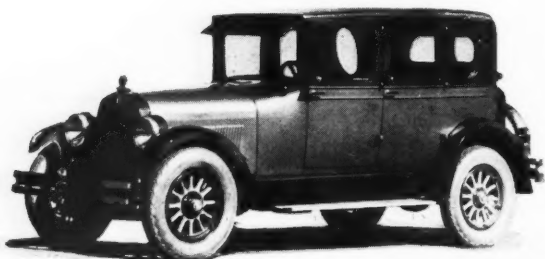
Above—Gardner eight cylinder Brougham; below—Gardner four cylinder Sedan

GARDNER. Drawing its share of the attention bestowed on the eight cylinder jobs is the neatly designed Gardner Brougham here illustrated, the other car being the Radio Special Sedan on the four cylinder chassis, which, with the rest of the four cylinder cars, is continued for 1925. The eight cylinder Brougham and the Special Touring on the same chassis sell for \$1995 and both have balloon tires, disteel wheels, and snubbers. Bodies patterned after European design and finished in two tone Duco add a final touch to these attractive cars. The Gardner Brougham has windows of clear vision plate glass and the interior is upholstered in velvet velour. The windshield is the one-piece ventilated type with automatic wiper. Doors are 31 in. wide and have walnut panels and double locks. Other features include satin finish hardware, rotary type lifts on all four windows, dome light, rear vision mirror, flush type cowl ventilator, combination stop and tail light, transmission lock and nickled radiator. On the Special Touring a permanent top is built, additional features including flush type cowl ventilator, cowl lamps, flat light reflector in headlights, automatic windshield wiper, transmission lock, stop light, combination stop and tail light, extra tire, tube and cover and bumpers front and rear.

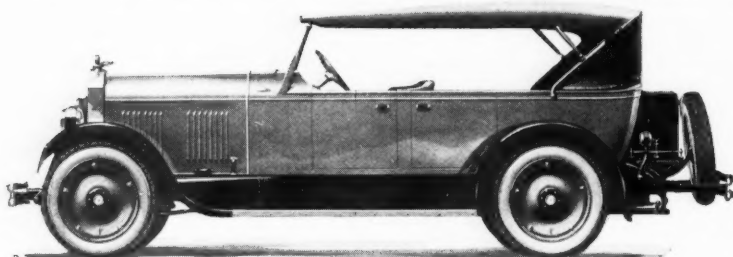
*The New Willys Knight Six Coupe-Sedan**The new Overland Six De Luxe Sedan*

WILLYS KNIGHT and OVERLAND. A new six in each line is on display, with the novel feature of the Overland Six line that no open models are being made, production being confined to a coach and a sedan. Wheelbase lengths of the Overland Six and Willys Knight Six are 112¾ and 126 in., respectively. Balloon tires are furnished on both models and the Knight Six is equipped with mechanically operated four wheel brakes and

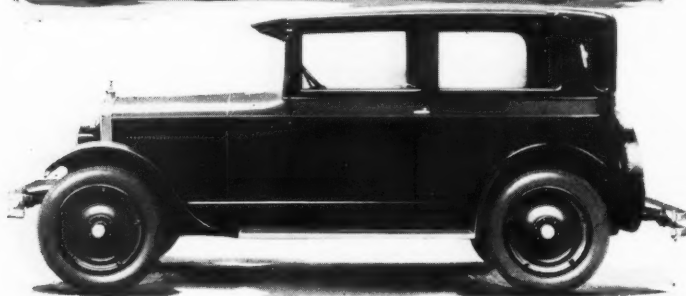
the Skinner oil rectifying system. A novel system of cooling is used in the Knight Six engine, by means of which the water is circulated to all parts of the cylinder walls by means of baffle plates. The sealing ring on this engine is also of new design. Its inner surface is grooved, and the lands thus formed fit into grooves on the lower end of the head casting.



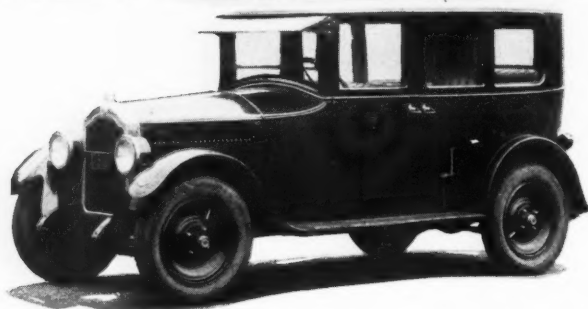
CASE. The Jay-Eye-See Brougham illustrated is a new Case product developed during the summer. The adjustable spring eye attachments, designed to keep shackles quiet, indicate the attention to detail which should make this car good for many years. Equipment of the Brougham includes hydraulic brakes, Cord tires, trunk, heater, automatic windshield wiper, mirror and clock, while disc wheels and balloon tires may be had for \$85 and \$40 respectively. The price of the Brougham with regular equipment is \$2690.



ELCAR. The eight-in-line Elcar, new at the show, is a Lycoming equipped car paying silent tribute to the power developments that racing has made possible. The five passenger touring car illustrated lists at \$2165. Both the open and closed models are painted Thebes Gray or blue with black and striped moldings. Lockheed hydraulic four wheel brakes are used while balloon tire equipment is accompanied by the installation of Gabriel snubbers. A Ross steering gear is used.



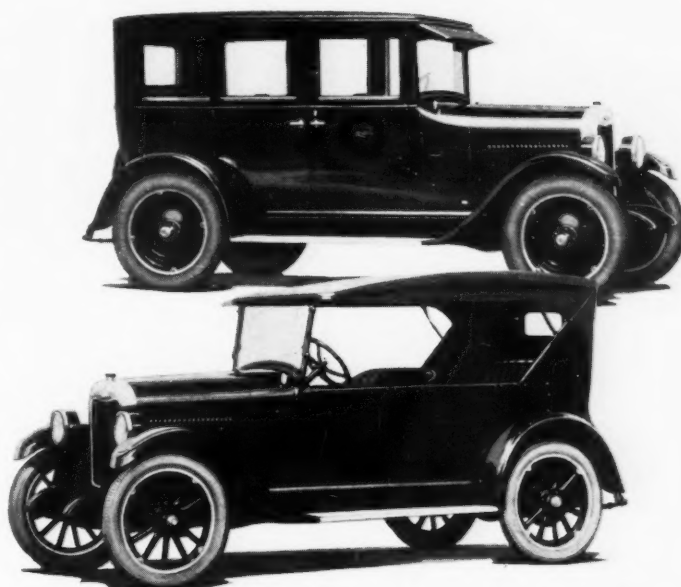
ROLLIN. The Rollin 5-Passenger Brougham is one of the 1925 models exhibited at the show. Finish is Duco, two tone, with wheels finished to harmonize with the body. Hood beading aluminum. Wide doors provide easy access to rear seats. Landaulet arms provide comfort to passengers. Luxuriousness and refinement of detail indicated in numerous points. Floor boards provided with felt silencers and covered with felt backed rubber mat. The price of the Brougham is \$1325. Other new models are the touring at \$1155, coupe at \$1325 and sedan at \$1455.



Reading down—The Case Jay-Eye-See Brougham, Elcar Eight, Rollin Brougham and Ambassador

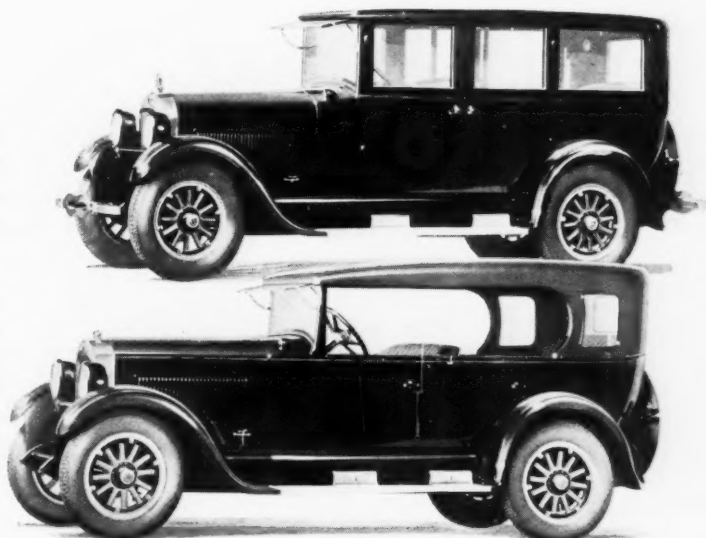
AMBASSADOR. The Ambassador "Drive-It-Yourself" Sedan, though constructed for hire service, embodies those features of ruggedness and durability which appeal to the fore handed man. Leather upholstery for example, adds to the resale value, and is more easily cleaned than cloth. Although made by the Yellow Cab Mfg. Co., it is not finished in Yellow, and resembles other well known medium priced cars, in general appearance. This sedan illustrated sells for \$1695.

CHEVROLET. The Chevrolet Sedan and Touring are representative of the completely redesigned Chevrolet, in which nothing much of the old model remains but the wheelbase. Bodies are Fisher built and are Duco finished, while the engine incorporates striking changes. These include a larger crankshaft, automatically lubricated rocker arms and new system of manifolding. The appearance of the engine has been modified by the valve and rocker arm covers. The lubrication of valve mechanism is attained by means of thick felt pads, riveted to the inner surface of each cover. These pads are saturated with oil and are of such a thickness that contact is made with rocker arms at the valve ends and bearing hubs, so that a supply of oil is gradually fed to the working parts. The cone clutch has been replaced with a single disc clutch of the dry plate type and the rear axle now is of the banjo type with heavier gears mounted on ball bearings.

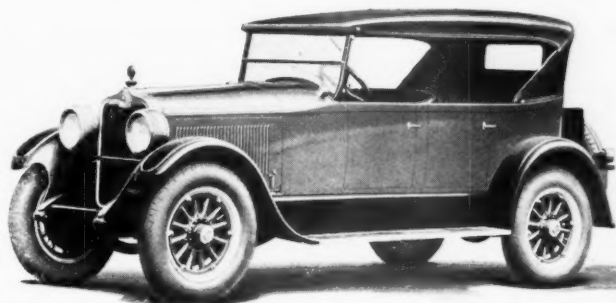


Above—The New Chevrolet Sedan; below—Touring on the same new chassis

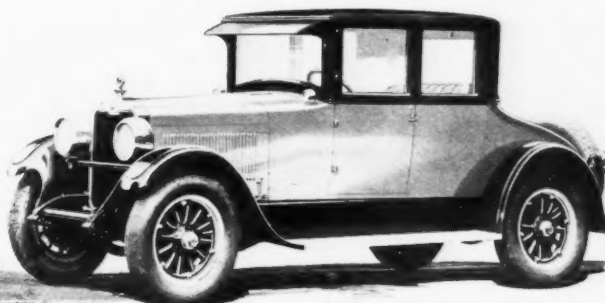
STUDEBAKER. Three practically new models make up the Studebaker line, as evidenced by the cars at the Studebaker exhibit. The ones illustrated here are the Studebaker Big Six 7 Passenger Berline and the Special Six 5 Passenger Duplex Phaeton. The Standard Six replaces the Light Six. More powerful engines have been attained by using higher compression, and in the case of the Standard Six by also increasing the piston displacement. Engines in the Special and Big Six have the Lanchester vibration damper. Studebaker Phaetons now have permanent tops of special design in which roller mounted curtains are concealed. In the event of encountering a sudden storm, it is only necessary to pull down the curtain and attach it by means of fasteners on the body.



Above—Studebaker Big Six Berline; below—Special Six 5-passenger Duplex Phaeton



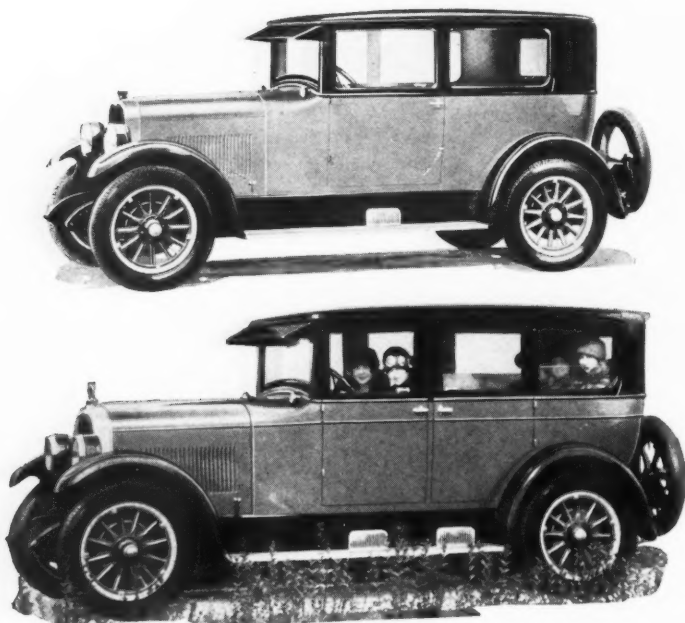
Peerless 4-passenger Touring



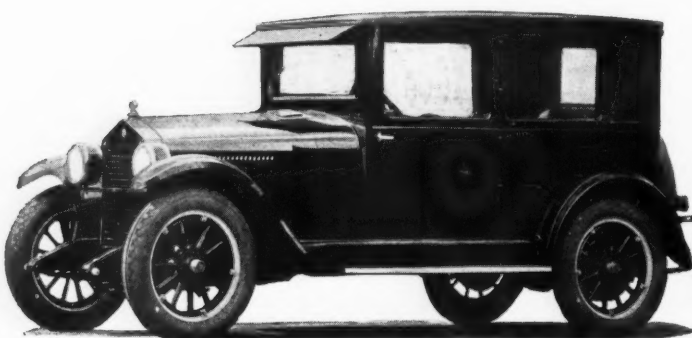
Peerless 4-passenger Victoria

PEERLESS. Both Sixes and Eights are shown at the Peerless booth, the technically inclined being absorbed in the idea behind the design which, it is said, entirely eliminates vibration from the Vee type eight cylinder engine. Silent timing gears also contribute to quietness of operation, and completely machined combustion chambers insure uniform compression in all cylinders. The Equipoised Eight is equipped with Peerless-Lockheed

hydraulic four wheel brakes and six ply balloon tires. The nickled radiator is of new design and the drum headlights are made of a special non-corrosive nickle alloy that requires no plating. The illustrations show the 4 Passenger Victoria and the 4 Passenger Touring Phaeton. The touring car has a permanent top with dome light, curtains with this model opening with the doors.



Above—The Cleveland Coach Premier; below—The Cleveland De Luxe Sedan

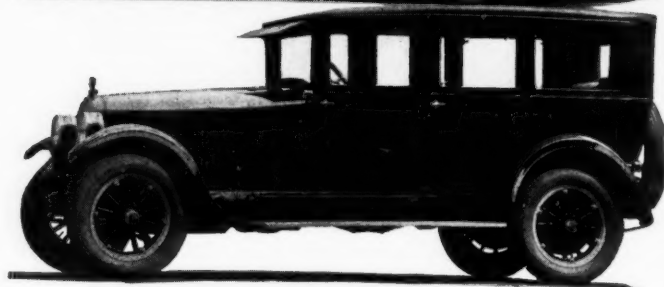
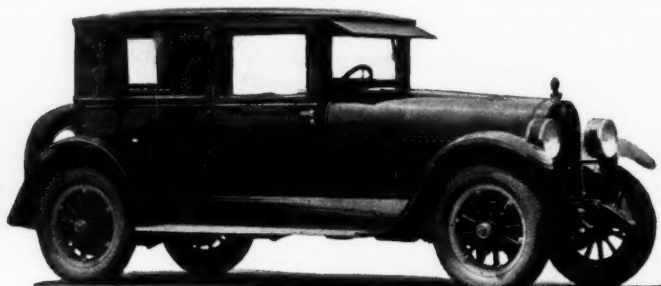


The Essex Coach

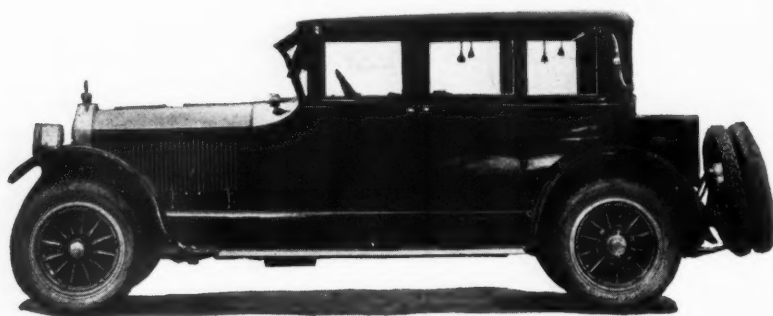
HUDSON. Cars exhibited at the New York Show by the Hudson Motor Car Co. will be substantially the same standardized units produced during the last year. A pioneer in coach construction, this concern is continuing its policy of producing a high grade closed car at a moderate price, accompanied as it is by the Essex. A production of over 180,000 coaches in three years testifies to the popularity of this type which, due to production economies, is now sold at a lower price than the open car. Hudson cars are now fitted with balloon tires as regular equipment.

CLEVELAND. The Coach Premier is the latest addition to the Cleveland line of six cylinder cars for 1925, this model selling for \$1295, and meeting the public demand for a closed car at open car price. In late years the talk of better chassis lubrication has found concrete expression in the Cleveland, where, by means of the "One Shot" lubrication system, pressure of the foot sends oil to all working parts of the chassis. Among the parts lubricated in this manner are the spring bolts, front wheel brake shaft, fan assembly, steering gear, ignition distributor shaft and clutch throw-out shaft. The new Cleveland has a redesigned engine which has higher compression, and a combustion chamber so constructed as to create turbulence in the incoming charge. Crankshaft is heavier, weighing 67 lbs. as compared with the former 50 lb. shaft. Bodies have been redesigned and radiator is higher. Open and coupe models are upholstered in leather, while taupe plush is used in the sedan.

ESSEX. No change is evident in the Essex Coach as far as the casual observer can determine. Production of a standardized six cylinder closed car at a moderate price continues to be the aim of its builders. The Essex motor embodies the same principles of construction used in the Hudson, which make possible high speed of rotation with a splash system of lubrication. Balloon tires are now standard equipment on Essex cars.



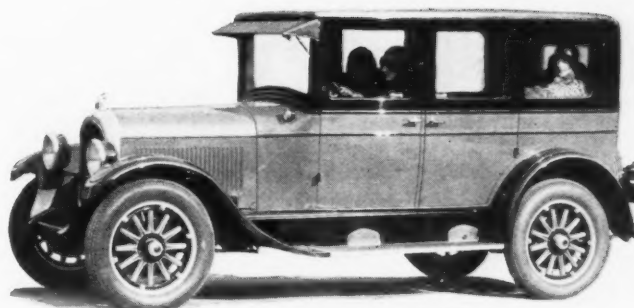
Above—The Hudson Coach; below—The 7-passenger Sedan



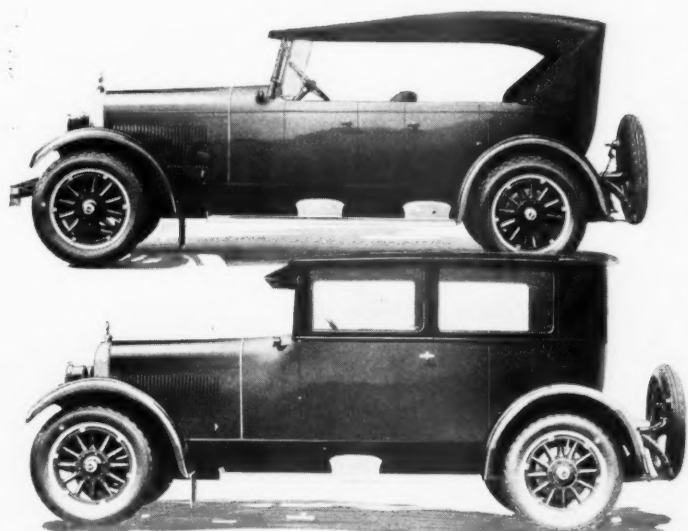
The Twin Valve McFarlan Sedan

McFARLAN. The car illustrated here is a Twin Valve 5-Passenger custom built McFarlan sedan, and it lists at \$6720. Other models range from \$5400 to \$10,000, while cars with the single valve engine range in price from \$2600 to \$4000. Exclusiveness is the key to the story behind these vehicles, developed by a concern long engaged in making fine coaches. Triple ignition conspires with the double valve construction to get 120 H.P. from the ample motor at 2000 R.P.M. Some brand new body types scheduled for production in 1925 are displayed at New York.

CHRYSLER. Chrysler cars for 1925 are continued unchanged, the body type here illustrated being the 5-passenger Imperial, selling at \$2065. A recent body type is the Town Car at \$3725. Closed bodies are Fisher built, the VV windshield and an automatic windshield wiper being standard equipment. In the Town Car the large glass panel at the rear of the driver and also the door windows are controlled by crank type regulators.

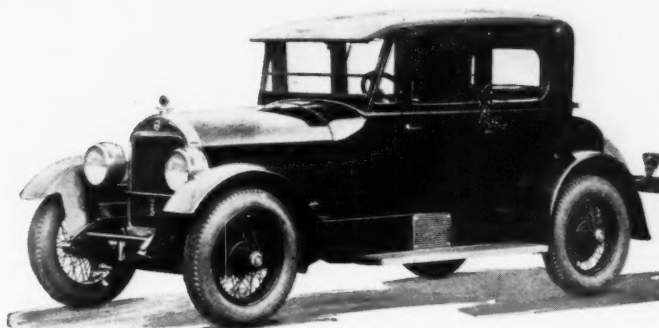


Chrysler 5-passenger Imperial



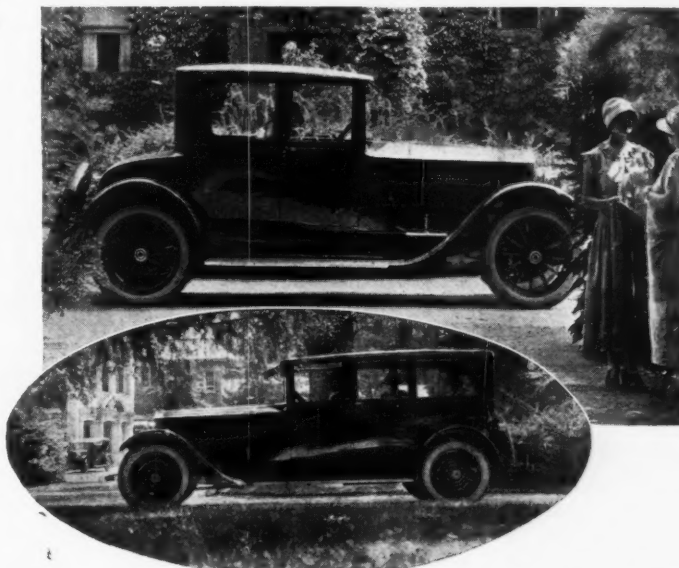
Above—Chandler Sport Touring; below—The Coach Imperial

STUTZ. Interest in the Stutz exhibit centers on the two new additions to the line, the 6-94 Sedan and the Coupe of the same model, the latter being illustrated. This coupe is a four passenger vehicle, designed with a rear deck compartment in which is ample space for golf clubs or other bulky luggage. An interior receptacle takes care of smaller packages. Wood wheels and cord tires are listed as regular equipment, with wire or disc wheels and balloon tires optional at nominal extra cost. The car is powered with the well known Stutz engine.

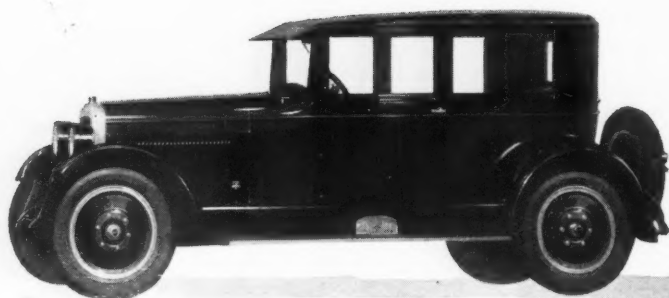


The Stutz 6-94 Coupe

PACKARD. A Packard Six Cylinder 4-Passenger Coupe at \$3275 and an Eight Cylinder 7-Passenger Sedan at \$4900—typical of the cars on display at the Packard exhibit. No changes this time, just the tried and proven units designed to facilitate service as well as to please the owner. Improvements have been made from time to time, but these do not show up to the casual observer and are detail refinements to make service profits a fact rather than a theory to Packard dealers.

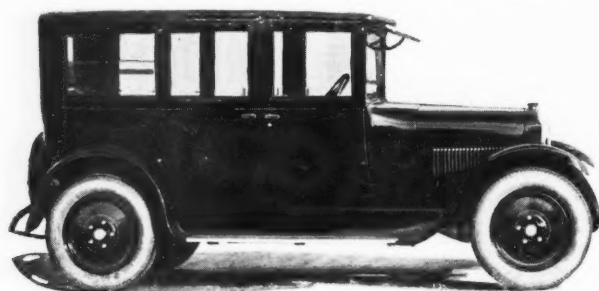
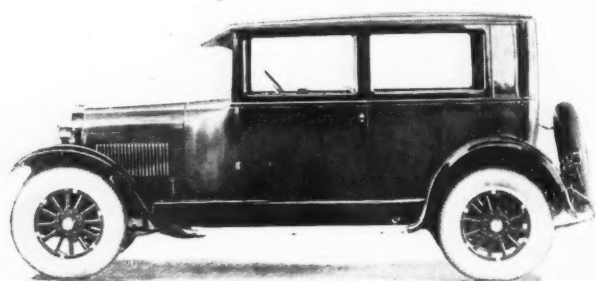


Above—Packard Six Cylinder Coupe; below—Packard Eight Cylinder Sedan

*Nash Advanced Six Sedan**Nash Advanced Six Victoria*

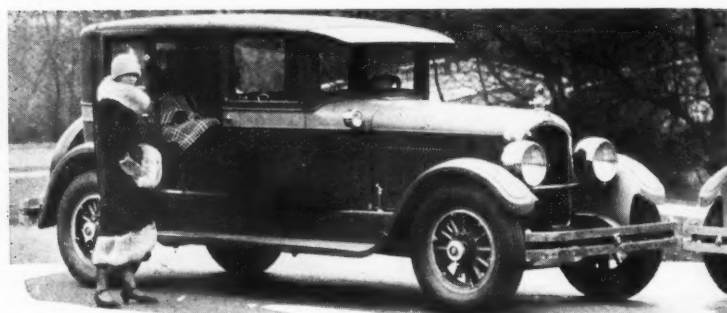
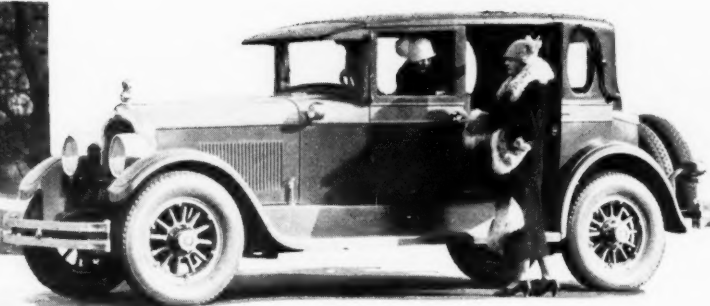
NASH. The two new Nash cars, shown for the first time at the New York show, are representative of the Nash line. One of these is the Advanced Six 5 Passenger Sedan built on the 121 in. wheelbase chassis. The other is the Advanced Six Victoria on the 127 in. wheelbase chassis. Both of these cars are equipped with full balloon tires, four-wheel brakes and five disc wheels as standard equipment. The four-wheel brake layout

is such that 40 per cent of the braking effort is exerted on the front and 60 per cent on the rear wheels. Force feed lubrication is used in the engine with which these cars are powered, the overhead valve mechanism also being lubricated from the same system. The rocker shaft is hollow and acts as a reservoir, feeding oil to both valve stems and push rods.



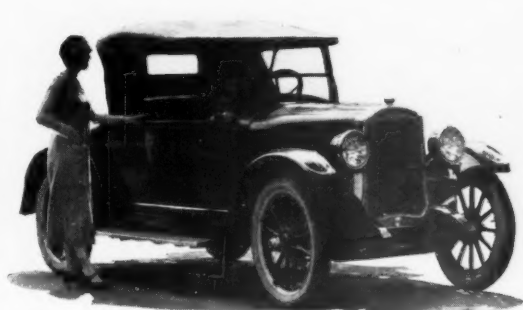
Above—The new Dodge Coach; below—The Dodge Sedan

DODGE BROTHERS. Production has been started on a new Dodge Brothers Coach, which is being displayed for the first time at the New York Show. The price of this model is \$1095. The body is finished in blue lacquer with yellow striping, the shroud and belt in black and the artillery wheels in blue. Each door has a pull handle and the right door is fitted with a Yale lock. The upholstery is dark brown. Equipment includes rubber mat in front section and carpet in rear, also dome light foot rest, mechanical window lifters, transmission lock, one piece windshield, automatic wiper and balloon tires. The Dodge Brothers cars here illustrated are the Coach and Sedan.

*New Marmon Sedan**Marmon four-door Brougham Coupe*

MARMON. Two of the New York Show Marmons are shown here, these being the New Four Door Brougham Coupe and the New Standard 5 Passenger Sedan. Other new models are the De Luxe Coupe, the 7 Passenger De Luxe Sedan, the 5 Passenger De Luxe Sedan, the 5 Passenger Sedan-Limousine De Luxe, the Roadster and the 5 Passenger and 7 Passenger Touring cars. Prices on closed models are \$130 higher than on open models.

Balloon tires are standard and Duco[®] finish is used. On open models a sun visor is furnished, while on closed models the top is extended to accomplish the same purpose. Other features of equipment include a three way lamp, which contains the tail lamp, backing light and stop light, double tire carrier with lock and dimmer switch on toeboard.



Oldsmobile Six Roadster

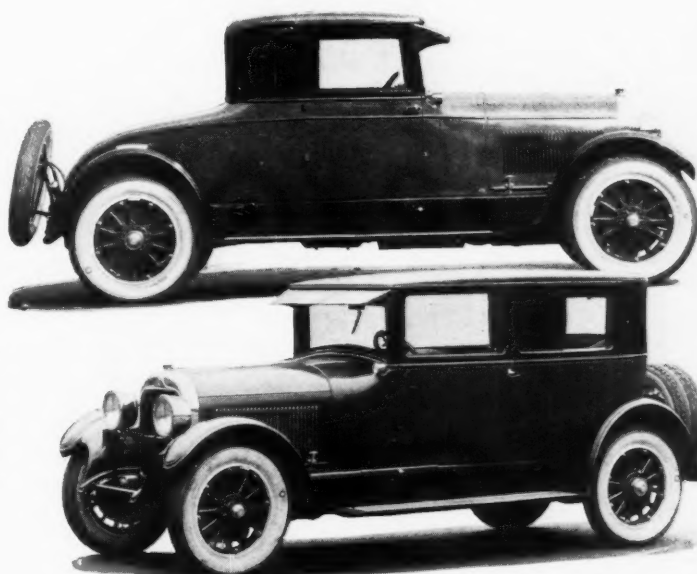


Oldsmobile De Luxe Sedan

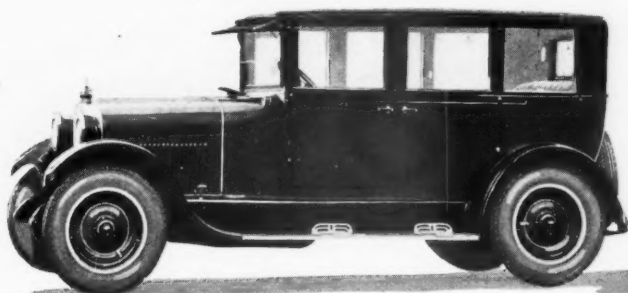
OLDSMOBILE. A snappy car for two is the Oldsmobile Six Roadster here depicted. The price is \$875. Its attractive companion is the 5 Passenger De Luxe Sedan listing at \$1375. Duco is used on all Oldsmobile cars, the sport touring and roadster being finished in the new "Biege," a light tan color. These sport models are fully equipped, being provided with nickeled

double bar front bumper, rear fender guards, aluminum trunk rails, metal trunk, mirror, robe rails, and on the open models, windshield wings. The De Luxe Sedan carries the same equipment, and in addition has sun visor, heater, dome light and the Fisher VV windshield and gasoline gauge.

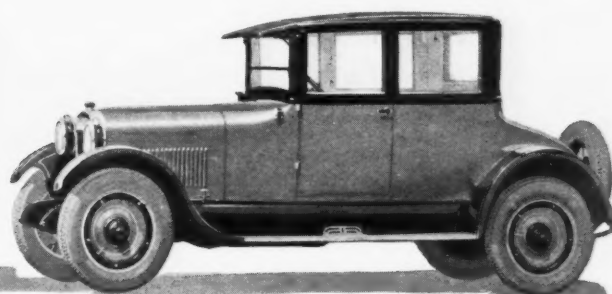
CADILLAC. With the introduction of the Cadillac Coach at the New York Show and simultaneously in dealer salesrooms throughout the country, all General Motors passenger lines include a Fisher-built body model of this general type. The new Coach lists at \$3185, which is also the price of the open models. The other Cadillac illustrated is the Custom Built Coupe, listing at \$3975. The scroll embossed nickel-plated radiator formerly used on custom built cars only, is now standard on V-63 models as well. The new coach is mounted on the 132 in. wheelbase V-63 chassis. It is a two-door job with the conventional seating arrangement for five passengers. Finish is green Duco with striping to match, the upholstery being in taupe mohair plush. Equipment includes mirror, windshield wiper, Fisher VV one piece windshield, dome light, visor, door locks, curtains, foot rest, trunk rack and window regulators.



Above—Cadillac V-63 Coupe; below—The new V-63 Coach



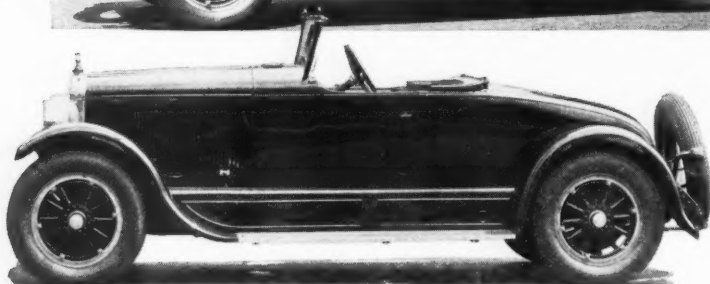
Reo Gold Standard Sedan



Reo Gold Standard Coupe

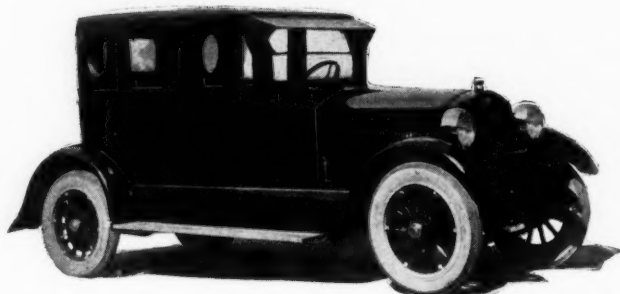
REO. The standard 120 in. wheelbase Reo chassis is provided with three new closed body models displayed at the New York Show. Two of these, the Gold Standard Coupe at \$1975 and the Gold Standard Sedan at \$2085, are shown here. The third is the new Reo Twentieth Anniversary sedan, which sells for \$1595. Balloon tires, 32 by 6.20, together with disc wheels, are standard on these cars. The Gold Standard Coupe is finished

in either gray or blue with mohair upholstery to match. The visor of this model shows the tendency in body design of making this detail as a continuation of the top. The Gold Standard Sedan is finished in gray with a blue belt. Equipment of both these models consists of electric clock, cigar lighter, cowl ventilator, rear view mirror, dome light, shades, and radiator cap with motometer.

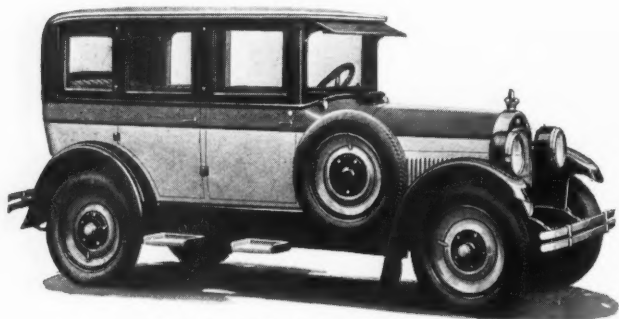


Above—The Jordan Victoria; below—The Jordan Playboy

STANLEY. A shorter wheelbase car is on display at the booth of the Steam Vehicle Corp. (Stanley), the length being 122 in. instead of 130 in. This car is 4 in. nearer the ground and is fitted with a new line of bodies, including a 5 Passenger Sedan at \$3300 and 5 Passenger Phaeton at \$2500. Tires are 31 by 4.95 balloon, with which the Ross cam and lever type steering gear is used. Service brakes are four wheel hydraulic contracting, while emergency brakes are rear wheel expanding.



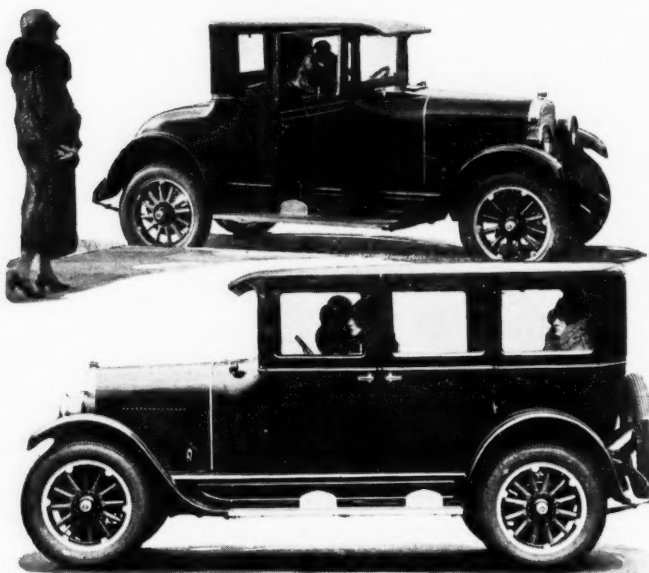
The Stanley Sedan



The Davis Series 90 Sedan

DAVIS. The new Davis Series 90 Sedan is being exhibited for the first time at the New York Show. This car is low hung without sacrificing head room. Davis Dual Tone finish is used and the upper rear body panel is covered with enameled top material. Balloon tires and hydraulic brakes are standard. Instruments are grouped under an oval glass panel on the instrument board. The price of the Sedan completely equipped is \$1995.

MAXWELL. Maxwell is exhibiting a new 2 passenger Coupe priced at \$1025, this being illustrated along with the Standard Sedan which sells for \$1345. In the new coupe the door width has been increased to 36 in. and the rear quarter windows have been eliminated. The finish is dark blue Duco and the upholstery is plum colored leather. In addition to the large compartment in the rear deck, there is also a space for parcels in back of the seat. The windshield is a one piece design and care has been taken to provide maximum vision for the driver. Equipment consists of 5.77 in. balloon tires on natural finish wood wheels, nicked radiator shell cowl lamps, stoplight, rear view mirror, scuff plates, tire carrier on left running board and sun visor integral with the roof.

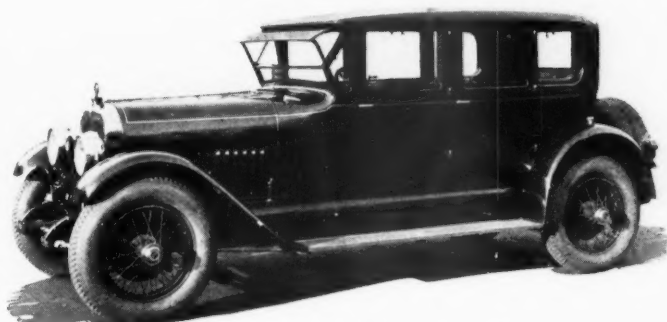


Above—Maxwell 2-passenger Coupe; below—Maxwell Standard Sedan

BUICK. The Buick line at the New York show includes these recent models, the Standard Coach and the 3 passenger Country Club Special, selling at \$1295 and \$2075 respectively. These motor cars reflect the response to the public demand for a closed car at a reasonable price and the demand for a chummy vehicle of distinctive appearance. The Country Club Special, also known as model 25-Six-54C, has room for three passengers in the inclosure while an extra seat for two is contained in the rear compartment. This body is mounted on the 128 in. wheelbase chassis which incorporates well known Buick features, among which are the mechanically operated four wheel brakes, multiple disc clutch, one piece windshield and ventilator with automatic windshield wiper. The Standard Coach, known as model 25-Six-20, is characterized by a door width which makes it possible for passengers in the rear seats to enter or leave without disturbing those in front. Duco finish, in pleasing color combinations, is used.



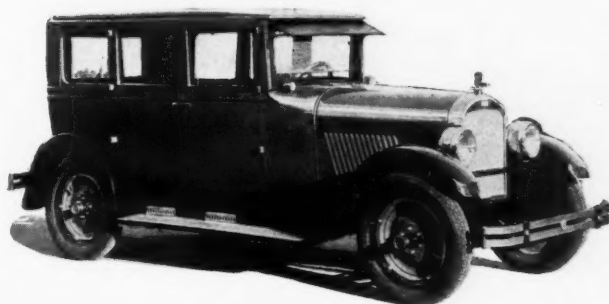
Above—Buick Country Club Special; below—Buick Standard Coach



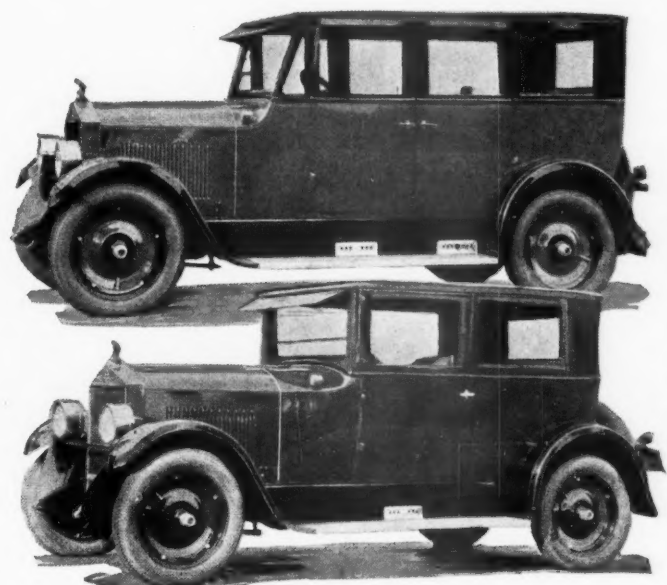
Mercer Series Six Sport Sedan

LEXINGTON. The Special Concord Sedan is being featured at the Lexington booth, this model having the latest body lines, including double belt mold and two tone finish in elephant grey and Maxine Blue. Balloon tires, 5.77 by 32, are used with 20 in. wheels. Hydraulic brakes are also available for 1925 as optional equipment.

MERCER. The Mercer Series Six Sport Sedan is a new model first shown at the show and is the car here illustrated. This body includes many new features not previously incorporated in Mercer cars. The chassis is also highly developed. Four wheel brakes are standard with balloon tires optional.



Lexington Special Concord Sedan

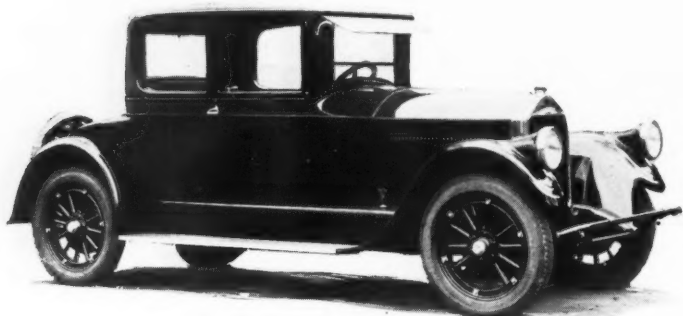


Above—Moon Series A four-door Sedan; below—The two-door Sedan, Series A

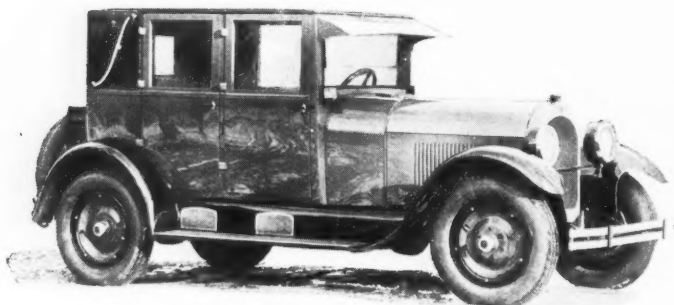
MOON. Balloon tires and hydraulic four wheel brakes are standard on Moon cars for 1925, a mechanically operated transmission brake as an emergency feature supplementing the hydraulic equipment. The cars here shown are the Series A Four Door Sedan and the Series A Two Door Sedan. A feature of the two door sedan is the right front seat which can be moved forward nine inches without being tilted or folded. It can also be put out of the way under the instrument board in the conventional manner. Finish of the two door sedan is gray satin Duco up to the belt line with black above. A black molding extends across the top of the cowl and along the sides of the car. Standard equipment includes cowl lights, toe plates, Perfection heater, metal sun visor and a Johnson theft proof transmission lock. Aluminum covered trunk rack and polished aluminum body rails are also included on this model.

*Auburn eight-in-line Touring*

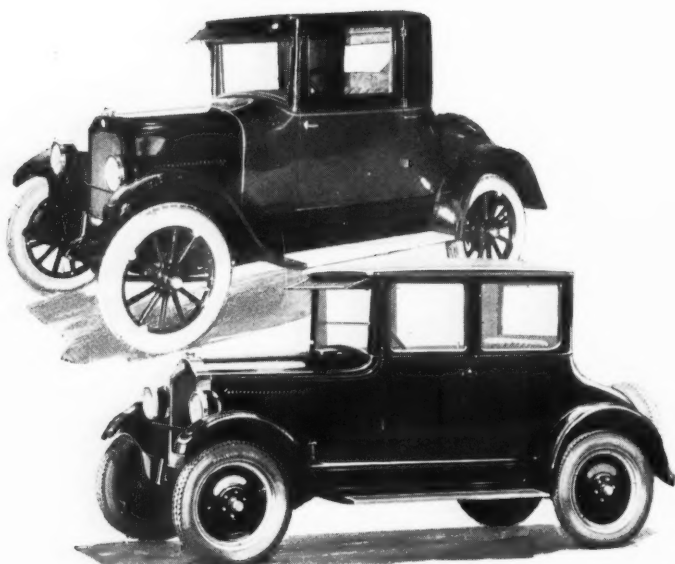
AUBURN. A newcomer into the eight-in-line field is this Auburn car, the touring car being priced at \$1895. Other models in the line are the Sedan at \$2550 and the Brougham at \$2395. The touring car has a permanent top reinforced with sheet steel to prevent sagging. A feature worthy of note is the built in windshield wings which swing with the doors even with curtains in use. These wings provide clear vision even with curtains attached.

*Pierce-Arrow Series 80 Coupe*

PIERCE-ARROW. This 4-passenger Pierce-Arrow Coupe is mounted on the series 80 chassis. It has four wheel brakes. The price is \$3695 in a wide variety of color combinations. A wide variety of body models is also offered in the higher powered chassis with the dual valve engine.

*Westcott three-door Brougham*

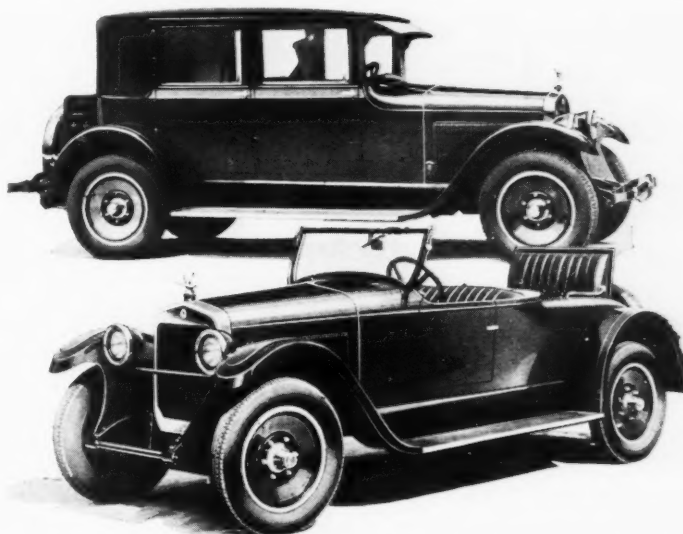
WESTCOTT. The Westcott models for 1925 include a 5 Passenger Sedan, a 4 Passenger Sedan, a Three Door Brougham and a Standard and Special Touring, each for 5 passengers. The Brougham is here illustrated, it selling for \$2290. Completeness of equipment characterizes Westcott cars, heaters being included on closed models. The Special Touring is like the Standard, except that more equipment is included.

*Above—The Star Coupe; below—The Gray Coupe*

STAR. The Coupe shown is a Star, one of a line of small cars designed to provide transportation at a low cost per mile. Perhaps this is the lightest car on which four wheel brakes are provided. The Star Special also has balloon tires and is equipped with five 20 in. disc wheels.

GRAY. This new Cozy Coupe is to be seen at the Gray exhibit, a car for three, priced at \$845. Body finish is black with a gold stripe, the radiator being nicked. Interior is finished in dressed corduroy. Driver's seat is ahead of the main seat, which accommodates two. Luggage space is provided in the rear deck and the equipment includes visor, windshield wiper and steel wheels.

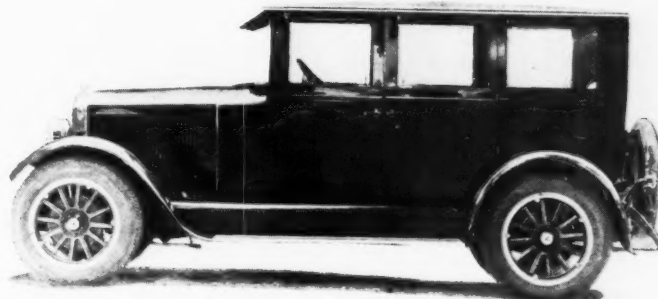
WILLS SAINTE CLAIRE. A new six cylinder Wills Sainte Claire is announced, the 5-passenger Sedan and the Roadster here shown being typical of the body styles available. Wheelbase is the same as the eight cylinder model and the appearance is similar. The engine is a highly developed design, incorporating many of the features of the eight cylinder power plant. In addition to the body styles shown, the line includes the Gray Goose Traveler (a 5-passenger phaeton), a 7-passenger phaeton, a 4-passenger coupe, a four-door brougham, a 7-passenger sedan and an enclosed drive limousine. Standard finishes are as follows: Gray Goose Traveler, sage brush green; brougham, limousine blue; 5-passenger sedan, moleskin; 7-passenger sedan and limousine, brewster green light, and 7-passenger phaeton, green gray.



Above—Wills Sainte Claire Six Sedan; below—Roadster on the six-cylinder chassis



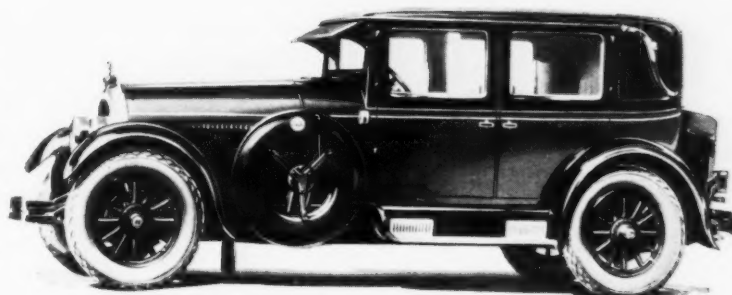
VELIE. A new Four Door Coach is the center of attraction at the Velie exhibit, the new type being designed to facilitate entering and leaving. The exhibit also includes an "X-Ray" edition of this coach, a cutaway model, with parts of both chassis and body shown. Steps in body construction and painting are apparent in this demonstration model. A completely equipped roadster of new design is also shown, this having a disappearing type of top. The line also includes a Standard Phaeton and a Royal Sedan. New models are provided with new type manifold that quickly heats the fuel to give efficient operation for winter driving. Hydraulic brakes and balloon tires are regular equipment.



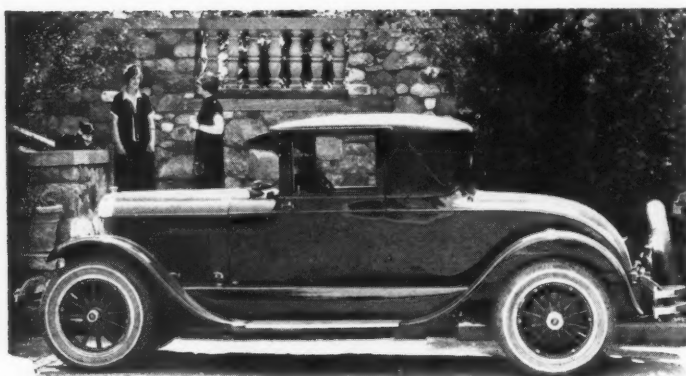
Above—Velie Club Phaeton; below—The four-door Coach



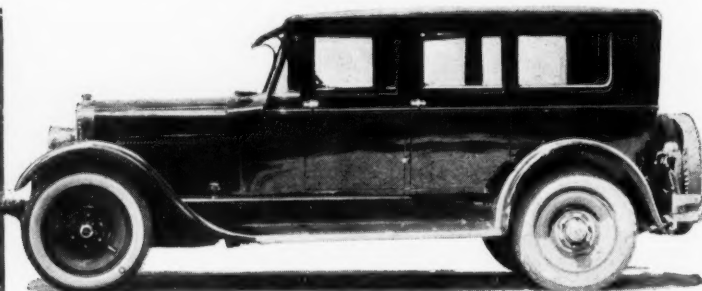
KISSEL. The very latest, this eight-in-line Kissel De Luxe Brougham Sedan, the main feature of the Kissel exhibit, but not the only feature of interest by any means. The new low priced 5 Passenger Brougham, powered with the advance engineered six engine at \$1895, the same price as the open model, is also due to get much attention from dealers and public alike. Lynite rods and reduction in reciprocating weight contribute to the performance of the Kissel six motor.



Kissel eight-in-line De Luxe Brougham Sedan

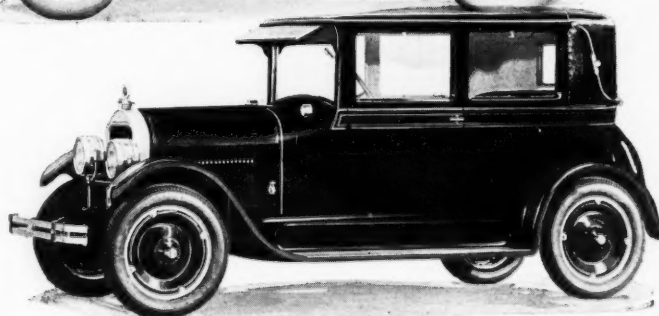
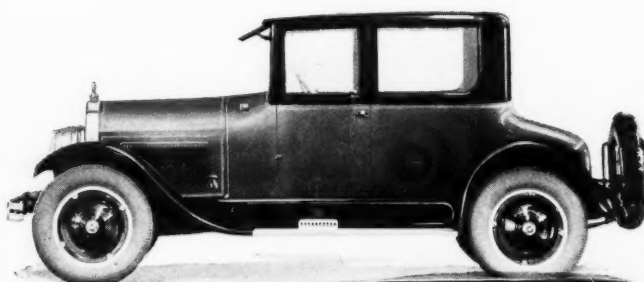
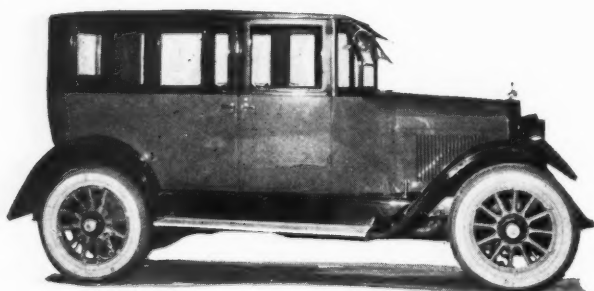
*Lincoln Coupe—2-passenger*

LINCOLN. The five Lincoln cars being displayed show a number of refinements over previous models. Radiator shutters are now vertical instead of horizontal. The fenders are new and provide better protection for the body from road dirt and mud, as well as improving the appearance of the car. The Fleetwood limousine is presented in Thistle green, with wire wheels and standard tires, while the Brunn design 5 Passenger Sedan is finished in Orriford Lake and is equipped with natural wood wheels and balloon tires. There are two cars with Judkins bodies, the Berline, done in Maxine blue, with wire wheels and balloon tires, with spares in well fenders, and the 2 Passenger Coupe done in green gray. It is equipped with disc wheels and balloon tires with two spares. The Phaeton, a 4 passenger car, is shown in gray with dual tone upholstery and equipped with disc wheels and balloon tires.

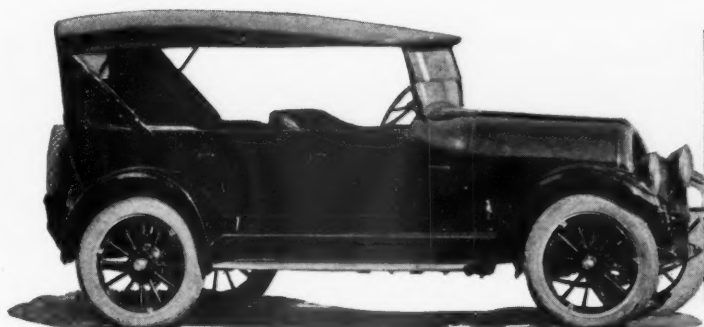
*Lincoln 7-passenger Limousine**The Apperson Straight-Away Brougham*

APPERSON. The Straight-Away Eight is being announced at the show, and models exhibited, although the V-eight and the Six will be continued. The new line includes a Brougham, as shown, this selling at \$2800, a Coupe at \$2800, a Sedan at \$2850 and a Sport Phaeton at \$2550. The new car chassis has a wheelbase of 130 in. All 1925 models carry balloon tires and have the mechanical gear shift. They are also characterized by very complete equipment.

FLINT. Simultaneously with the opening of the show comes the Flint announcement of six new models. On the "55" chassis are the Four Door Brougham, 4 Passenger Roadster, Sport Touring and Winter Enclosure Touring, while on the "40" chassis are the Closed Couplet Brougham and the Winter Enclosure Touring. The cars here illustrated are the "55" 4 Passenger Coupe and the "40" 5 Passenger Closed Couplet Brougham, the latter being an entirely new body style. A unique feature of Flint closed cars is the automatic window lift which operates by a slight turn of a knob. A heavy spring roller operates the window and the knob locks the window in any position. Closed models also have overhead ventilators to give fresh air without creating drafts in the car.

*Above—Flint 4-passenger Coupe; below—The new closed Couplet Brougham**Stearns-Knight Sedan*

STEARNS. Knight motored cars made by Stearns in 1925 are continued in three chassis types and a variety of body models. Model C, on a 119 in. wheelbase chassis, is powered with a six cylinder engine having cylinders $3\frac{1}{4}$ by 5. The 119 wheelbase model B uses a four cylinder engine, $3\frac{3}{4}$ by $5\frac{3}{8}$, while the large six cylinder model known as Model S carries a $3\frac{1}{2}$ by 5 engine.



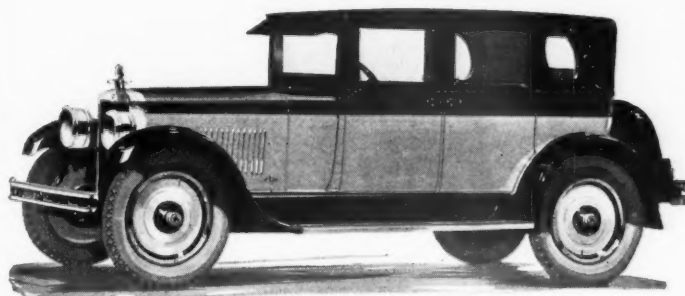
The Model 10-C Franklin Touring



The Franklin Sedan

FRANKLIN. The model 10-C Franklin is the series of cars being displayed at the Franklin exhibit, the Sedan at \$2850 and Touring at \$1950, as illustrated, being typical of this model. Great increase in power is the chief feature of this new Franklin, developed since the last show, and made possible by still greater cooling efficiency, together with increase in size of the exhaust line and revised intake manifold. Easy starting is obtained with

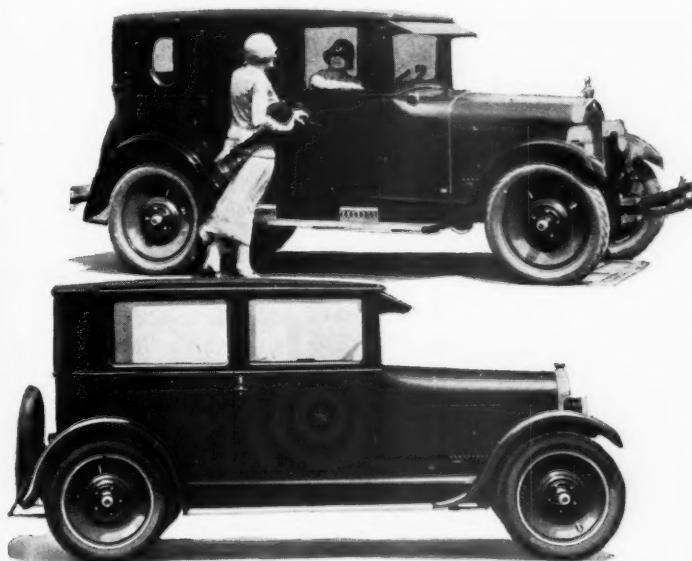
the new electric primer, which is in the form of a U tube, the lower portion of which is kept filled with gasoline, by means of a connection with the carbureter. A heating coil of non-corrosive resistance wire not only warms up the gasoline in the tube, but also the vapor which is drawn from the primer. The Alemite Gascolator is also used in the fuel system. Balloon tires are now standard equipment on all Franklin cars.



Rickenbacker Coach Brougham

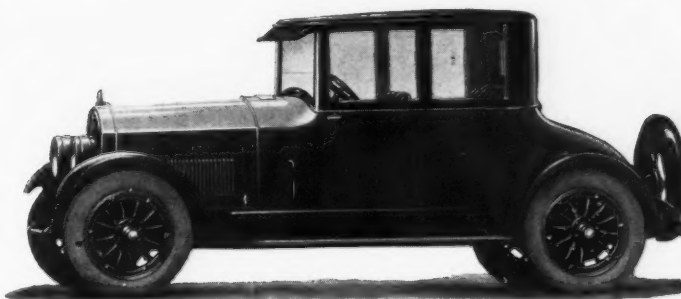
RICKENBACKER. On the eight cylinder chassis there is shown a new body, the Coach Brougham, which, fully equipped, lists at \$2395. The six cylinder model is powered with the same engine formerly used, except that a number of refinements have been incorporated to increase the efficiency and give improved performance.

OAKLAND. High spots in Oakland's production schedule for 1925 are the two new cars, the Coach and Landau Sedan here shown. These two new types, with the Standard Sedan, the 4 Passenger Coupe and the Landau Coupe make up the closed cars for the coming year. In the open models are presented the Touring, Special Touring, Roadster and Special Roadster. The Coach has low sweeping lines, well rounded corners and a custom built appearance characteristic of Fisher bodies. Full steel body panels enclose the car. Two large doors provide easy access to the interior. Seating capacity is provided for five passengers. Front seats are of the Pullman type, heavily upholstered and folding forward to allow entrance to the rear compartment. Automatic windshield wiper and rear view mirror are standard equipment. The body, hood and disc wheels are finished a sagebrush green with orange striping; the fenders, running gear and upper structure are finished in black.



Above—Oakland Landau Sedan—below the new Coach

COLE. The Cole line for 1925 is to be the same as for 1924, the Imperial Coupe illustrated being representative of the Cole closed body types. Stop light and visor are features of the equipment of this Coupe and balloon tires are provided for all models.



The Cole Coupe

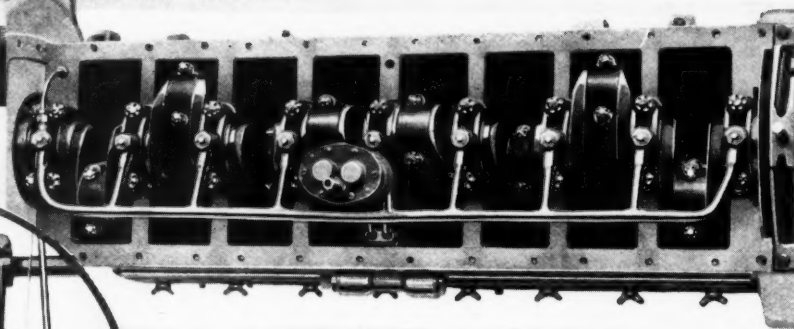
Interesting Talking Points of Cars of Today



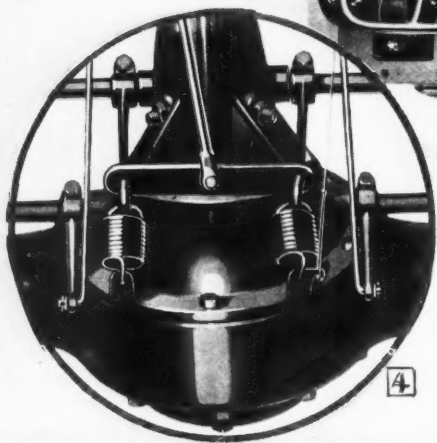
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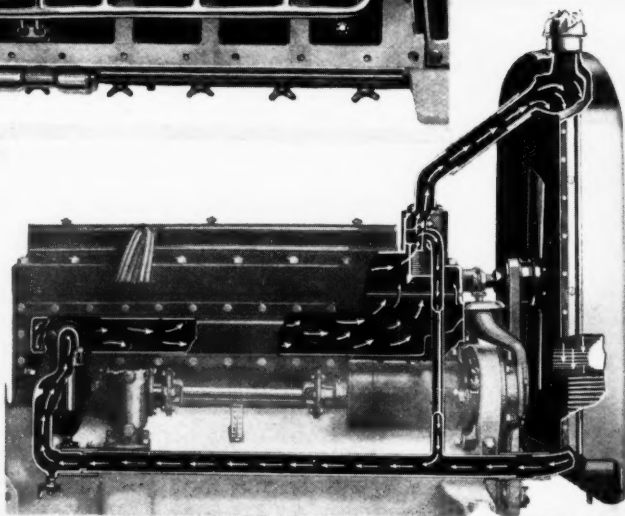
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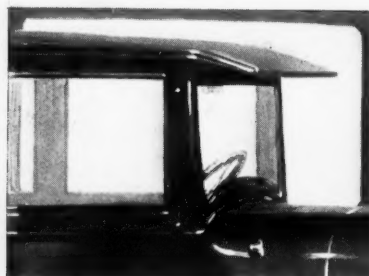
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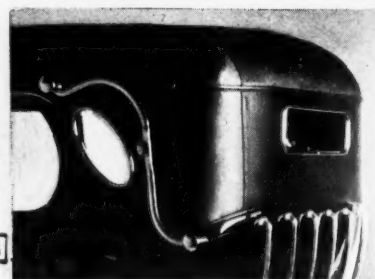
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8

1—Convenient means for regulating windshields. 2—The extra seat for two passengers in the rear deck of roadster. 3—A main bearing between each crank throw is the rule on many cars. 4—A novel brake equalizer on one of the lower priced models. 5—One of the thermostatically controlled cooling systems. 6—Grouping the instruments under a single glass panel is done by many car manufacturers. 7—Visors instead of being attached are an integral part of the top on many cars. 8—Landau bows are more popular than ever this year

New Cars Ready for First Showing at New York

Automotive World Looks With Interest Upon Unusual Number of New Designs in Four, Six and Eight Cylinder Vehicles Offered to the Public at Silver Anniversary Exhibition

WITHOUT a doubt the outstanding feature of the new cars recently announced is the movement toward the eight-in-line engine. While several new cars powered with this type of engine were announced last Fall, some makers chose to wait for the New York Show to officially launch on the market with their new product. Duesenberg, Packard, Rickenbacker, Jordan, Auburn and Elcar have been in the field of straight eights over varying periods, while the very latest additions are Apperson, Hupmobile, Kissel and Gardner. With such an aggregation of reputable car builders behind the straight eight it appears that the basis of appeal of this kind of car is pretty well established.

Accessibility a Feature

Aside from what may be said of the straight-eight engine from a performance standpoint, there is the feature of accessibility. The mere addition of two cylinders, comparing now the straight-eight engine with the six, means very little in the amount of extra work in taking off such parts as the head, grinding valves, etc., and this fact is clearly driven home by the maintenance operation costs of similar jobs performed on the two types of engines.

Much has been done of late to get even smoother running engines. Counterbalanced crankshafts play a major role in new engines and many makers, new and old, are placing a bearing between each crank throw. Smoother performance has been secured also by using main bearings of larger diameter and length.

NEW CARS DESCRIBED ON FOLLOWING PAGES

Apperson eight.
Cadillac coach.
Chevrolet.
Gardner eight.
Hupmobile eight.
Jewett six.
Kissel eight.
Overland six.
Paige.
Rickenbacker eight and six.
Wills Sainte Claire six.
Willys Knight six.

Four-wheel brakes are holding their own and several new cars are offering them as optional or standard equipment. Much improvement has been made in the brake linkage and methods of equalizing. The 40-60 ratio, that is application of 40 per cent of

the braking force on the front wheels and 60 per cent on the rear, still seems to be the more or less accepted rule.

Practically all of the new models are using balloon tires, although in some of the smaller cars cord and fabric tires prevail. However, even on these cars, some of the makers are offering balloon tires at a slightly higher price.

In connection with balloon tires mention should be made of the wholesale adoption of steering devices to afford greater leverage necessary to get a balloon tire-equipped car away from a curb, or when the car is traveling slowly, and especially around corners. Nearly every car maker who is using balloon-tire equipment has changed the steering gear in his car in various ways to get a variable reduction.

In looking over the new cars announced recently one cannot avoid the impression that the open model will soon become a special instead of a regular production job with some makers. In fact, this is already the case with some. In another, the new Overland six, only a sedan and coach are built, no open model being available. Many are selling their open and closed models at the same price, while in one case the open model is actually more than the closed.

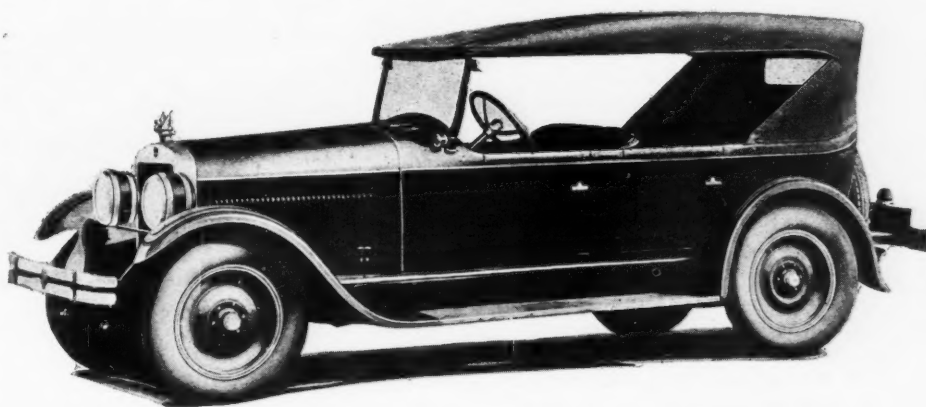
Gardner Eight in Brougham and Touring

IN order to get a more complete line for its dealers the Gardner Motor Co., Inc., St. Louis, Mo., has brought out an eight-in-line model to be made in a brougham and special touring, the two to sell for exactly the same price—\$1995. At this price both models are fully equipped with many detailed refinements. Both are five-passenger cars and are mounted on a 125-inch wheelbase chassis, fitted with 30 by 5.77 balloon tires, four-wheel brakes and Distel wheels. A two-tone Duco color combination is used on both the closed and open model.

The brougham is built with a low-swung body and a rather pleasing effect is secured by terminating the rear of the body approximately at the center of the rear wheel, thus allowing sufficient room for a large sized trunk and the extra wheel and tire. A double belt-line ex-lour. Doors are 3-in. wide and have wal-

tends entirely around the car. The windows are of clear-vision plate glass and the interior is upholstered in velvet ve-

nut panels and double locks. A one-piece ventilating type windshield is fitted, having an automatic wiper. A visor over



The Gardner straight eight touring model which has a wheelbase of 125 in.

the windshield is secured by extending the top without a break.

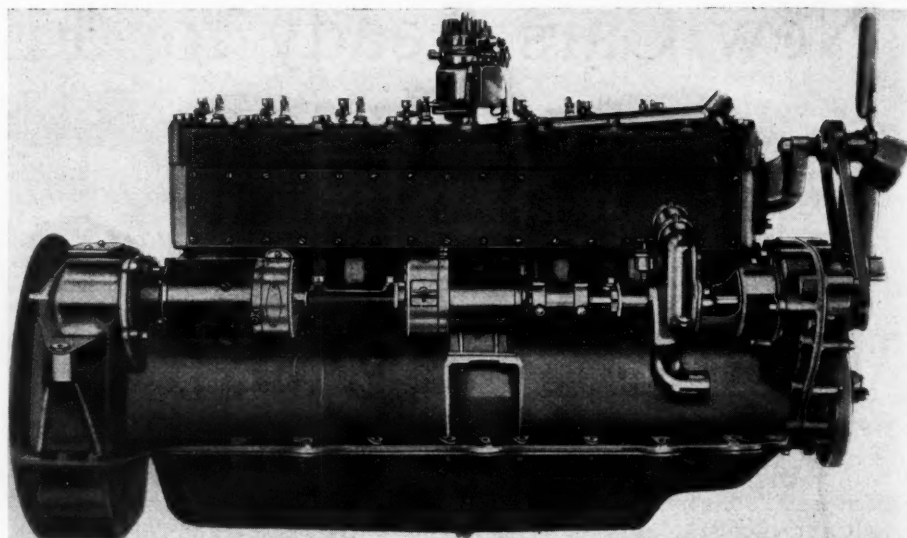
Other features of the Gardner brougham include satin finish hardware, rotary type lifts on all windows, dome light, rear vision mirror, flush type cowl ventilator, combination stop and tail light, nickled radiator and transmission lock.

Refinements On Special Touring

Refinements such as a permanent top, flat light reflector in headlights, spotlight, double bar bumpers front and rear are also found on the special touring. In this model the seats are upholstered in Spanish leather. On both open and closed models the instruments, including a heat indicator and gasoline gauge are grouped under a single glass oval panel, indirectly lighted.

As in the case of the Gardner four-cylinder model the engine in the new eight is of Lycoming make. This engine has been described in these columns before. In the Gardner eight the engine is fitted with a Swan manifold and a cylindrical type vertical oil strainer which can be readily removed for cleaning. Oil pressure is automatically controlled by the opening and closing of the throttle.

The frame is made up with 7-inch side rails and has six cross members, two of which are tubular. It is heavily gusseted. Semi-elliptic springs are used and these are attached to the frame by the conventional steel shackle. The chassis is lubricated by the Alemite system, excepting



Right side of the straight eight engine used in the new Gardner. Incidentally, this illustration shows the accessibility of the straight eight engine

the fan and universal joints which are of the oil type.

The radiator of the eight is of an entirely different design from the Gardner four radiator and is nickled, with the Gardner nameplate worked out in a satin bronze.

Specification of Gardner Eight-In-Line

Price, brougham and touring\$1,995

Seating capacity, both models5 passenger
Wheelbase125. in.
Engine....Lycoming eight, 3 1-8 bore by 4 1-2 in. stroke
Horsepower, brake...75 hp.
Electric SystemRemy
CarburetorSchebler
ClutchBorg & Beck
Steering GearGemmer
AxlesColumbia
SnubbersBalloon tire type
RadiatorFedders

THE WEEK IN NEW YORK

Conventions and Other Meetings Scheduled in Connection With the Silver Anniversary Show

Friday, Jan. 2

Banquet, Bronx Automobile Dealers' Association, Concourse Plaza Hotel.

Saturday, Jan. 3

7:00 p. m. Banquet, Paige-Jewett dealers, Hotel Commodore.

Monday, Jan. 5

10:00 a. m. Convention, Motor Trucks, Auspices of N. A. C. C. at N. A. C. C. headquarters, 366 Madison Ave.

10:00 a. m. Second Annual Show Convention of National Automobile Dealers' Association, Hotel Commodore.

10:30 a. m. Meeting, Rubber Association of America, Hotel Commodore.

12:00 m. Luncheon, Nash dealers, Hotel Commodore.

12:30 p. m. Luncheon, Willys-Overland dealers, Hotel Biltmore.

1:00 p. m. Luncheon, Hupmobile dealers, Hotel Commodore.

7:00 p. m. Dinner, Rubber Association of America, Hotel Commodore. Meeting, Automotive Electric Association, Hotel Astor.

Tuesday, Jan. 6

10:00 a. m. Meeting, Advertising managers, Auspices of N. A. C. C. at N. A. C. C. headquarters, 366 Madison Ave.

10:30 a. m. Mexican Mission, at N. A. C. C. headquarters, 366 Madison Ave.

1:00 p. m. N. A. C. C. Directors' Meeting, at N. A. C. C. headquarters, 366 Madison Ave.

1:30 p. m. Joint meeting, Metropolitan Section and Empire

State Section, Automotive Electric Service Association, Hotel Astor.

2:00 p. m. Export Trade Day, Joint auspices of Motor & Accessory Manufacturers' Association, Overseas Club of Automotive Boosters International, American Automobile (Overseas Edition) and El Automovile Americano, Lecture Room of the Armory.

3:00 p. m. Meeting, Traffic Planning and Safety Committee, at N. A. C. C. headquarters, 366 Madison Ave.

6:30 p. m. Annual Banquet, National Automobile Chamber of Commerce, Hotel Commodore.

7:00 p. m. Automotive Electrical banquet, Hotel Astor.

Wednesday, Jan. 7

10:00 a. m. All day dealers' meeting, Oldsmobile, Hotel Commodore, to 6 p. m.

10:30 a. m. Mexican Mission, at N. A. C. C. headquarters, 366 Madison Ave.

1:00 p. m. Luncheon, Franklin dealers, Hotel Commodore.

1:00 p. m. Luncheon, Oakland dealers, Hotel Commodore.

2:00 p. m. Annual Meeting, Motor & Accessory Manufacturers' Association, Hotel Astor.

6:00 p. m. Banquet, Oldsmobile dealers, Hotel Commodore.

7:00 p. m. Banquet, Motor & Accessory Manufacturers' Association, Hotel Astor.

7:00 p. m. Banquet, Studebaker dealers, Hotel Plaza.

Thursday, Jan. 8

10:00 a. m. Council Meeting, S. A. E., Engineering Societies Building, 29 West 39th Street.

12:30 p. m. Luncheon to Buick National Distributors and Branch Managers, Hotel Commodore.

6:30 p. m. Annual Dinner, Society of Automotive Engineers, Hotel Astor.

Meeting, Rickenbacker dealers, Hotel Commodore.

Kissel Straight Eight Supplements Its Line of Sixes

INCORPORATING many of the same engineering features of its six-cylinder model, the Kissel Motor Car Co., Hartford, Wis., has added the new Kissel Straight Eight to its lines. The eight-cylinder model is furnished in the same body styles as the six with the exception of the low-priced brougham at open-car cost, which is furnished in the six only. Balloon tires 33 by 6 and hydraulic four-wheel brakes are standard on the eight as well as the six. Tests have shown that 75 m. p. h. is possible with the new eight. Good acceleration, plenty of power on hills and freedom from vibration are other qualities put forth by the Kissel company for the car.

The headliner of the straight eight line will be the new four-door De Luxe brougham sedan. This model has unusually wide 32-inch doors, making access to the interior easy while the window corners are rounded instead of being square. With its long hood and cowl and low-hung frame it has a rakish appearance, while the well-rounded corners and graceful sweep of its body lines are carried out even to the trunk on the rear. The rear quarter of fabric is surmounted by a landau bow, a feature characteristic of other closed models in the Kissel line.

Many features of the eight-cylinder engine are features found in the six, namely the extra large aluminum oil basin, Lynite rods and pistons, full pressure oil system to all bearings and front and silent chain drive, Kissel's thermostat head and by-pass, and other features. The eight has a 3 3/16 in. bore, 4 1/2 in. stroke and 287 cu. in. displacement. At 2400 r. p. m. it develops 62 1/2 h.p. The cylinders are cast in block and are of the L head type with valves on the left side.

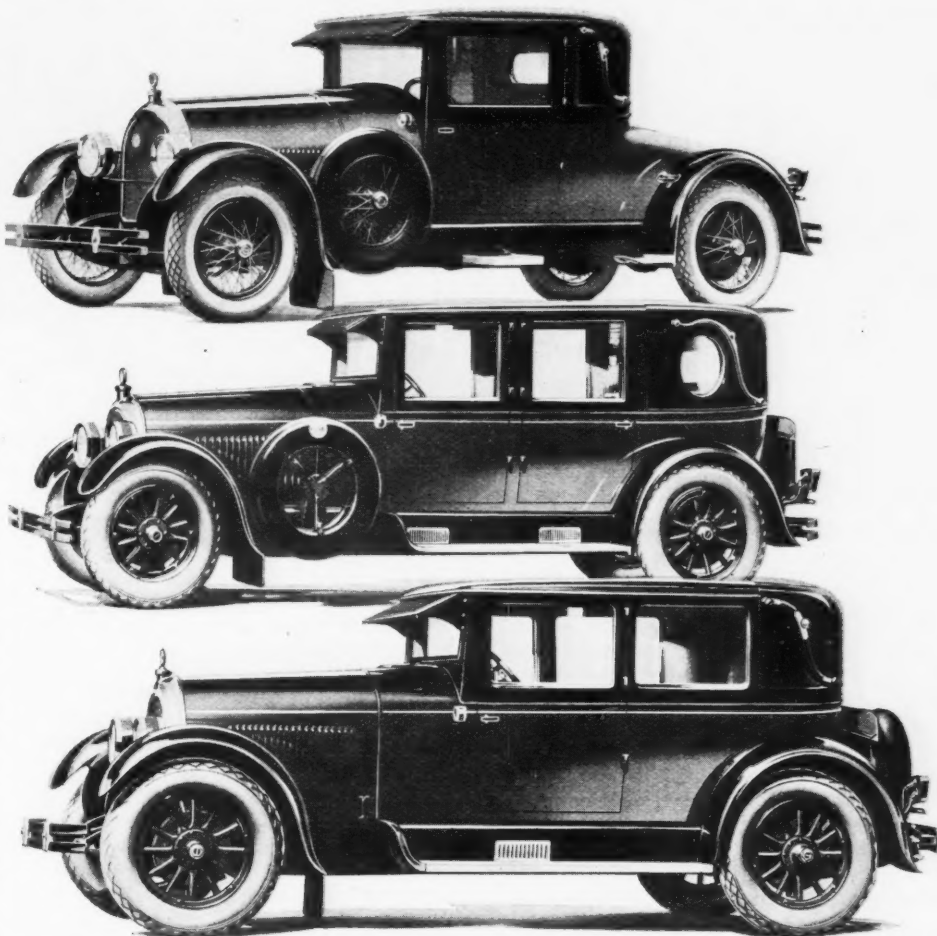
Cylinders Are Honed

The wheelbase of all models is 126 in. with the exception of the seven-passenger Berline-Sedan, which has a wheelbase of 137 in. Both the six and the eight have the Ross variable ratio cam and lever steering gear and Link Belt silent chain front-end drive, two new features.

The cylinders are honed after machining and grinding. This has been done to make the cylinder walls smooth and to get rid of the first "wear-in."

Force-feed oiling is used to the main bearings, connecting rod bearings, camshaft bearings, and front-end drive. There is a large increased supply of oil to the wrist pins, pistons and rings, also to the push rods. The oil pressure is all the way from 25 to 100 lbs. This means added clearance of all of the working parts for the extra oil film under pressure. It adds materially to the smoothness of the engine and makes possible high running speed continuously.

Lynite connecting rods and pistons are used. With these rods and pistons there is a saving of 14 lbs. in weight of the reciprocating parts.



Three of the new Kissel models. Top to bottom they are: the model 55 enclosed speedster; straight eight Berline sedan and the six-cylinder Brougham

The pistons are fitted with the Teetor oilproof rings, the lower ring having a groove which permits the use of a large amount of oil but prevents it from going past the pistons. The top three rings have an oil recess to keep the oil on the cylinder walls.

The piston pins are locked tight into the connecting rod, making the bearing in the piston itself. This gives a bigger bearing and also ample lubrication for the piston pin and the bearing surface.

The oil basin is made of aluminum and made deeper. This allows an extra supply of oil, as well as a very simple basin. It also permits two machined surfaces for a good gasket fit and generally eliminates oil leakage.

The connecting rod bearings are spun right into the rods. This eliminates any possible danger of a bearing not being seated properly in the rod itself. These bearings are then machined, breached, and burnished to fit.

The crankshaft, rods and pistons are all balanced dynamically and statically which with the light reciprocating parts gives extreme smoothness.

The straight eight is also equipped with an automatic chassis lubrication

system (Dawson patents) like the six, for lubricating the chassis with semi-fluid grease at points which heretofore have been fitted with ordinary oil cups.

It furnishes a substantial reserve supply of lubricant fed under constant pressure into the bearings in the right quantity for lubrication without waste, it is claimed. The car can be driven for several hundred miles with only one filling, it is said. Filling the oilers is a matter of but a few minutes. The piston in each oiler being forced upward or outward as the reservoir fills and drops gradually as it empties forms an accurate gage on the reserve supply of grease which may be determined at a glance, thus removing the danger of the system unexpectedly running dry.

Six-Cylinder Line

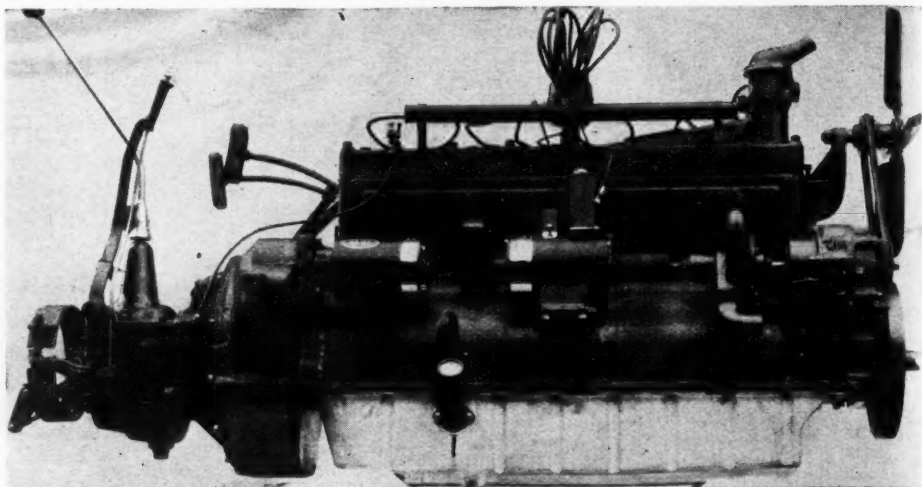
The headliner of the six line is a new low-priced five-passenger brougham. This model has a 121-in. wheelbase and four-wheel hydraulic brakes and balloon tires are standard equipment on this model, as well as all models in the six line.

The new six-cylinder brougham has two 30-in. doors and the corners of all windows are rounded instead of square.

The car is low hung and rakish in appearance and the body lines are gracefully curved. The rear quarter of fabric is ornamented by landau bow.

The interior is upholstered in Chase mohair in a combination striped and plain effect. There are two full-size folding front seats and a full-width back seat capable of seating three people comfortably without crowding. All four windows may be raised or lowered by rotary regulators.

This car also has the regular Kissel full crown individual sport fenders and three-quarter-length running board. It is finished in black Duco with three-line crimson stripe and crimson wood wheels and comes equipped with spare rim on the rear behind the trunk rack. Other equipment includes headlights, cowl lights, combination stop and tail light, speedometer, ammeter, oil gauge and dash lamp. In this line of sixes is a new De Luxe model brougham sedan. It is similar in general appearance to its sister model described above. Its four 32-in.



Right side of the Kissel straight eight engine, showing the additional flywheel at the front end

doors permit free access to the front and rear seats. This new sedan is upholstered in silk plush mohair and the seats are deep and comfortable with ample room

for five adults. This car comes fully equipped, including such items as bumpers front and rear, electric clock and trunk.

New Chevrolet an Entirely Redesigned Model

A NEW Chevrolet car with Duco finish, longer bodies, complete semi-elliptic spring suspension and outstanding changes in every mechanical detail makes its first appearance at the New York Show. Although the wheel-base remains at 103 in. this is practically the only feature of the car identical with the older model. In addition to the striking change in frame and spring arrangement, the engine has been redesigned to incorporate a larger crankshaft, rocker arms are enclosed and provided with means of automatic lubrication and the manifolding has been redesigned to provide better distribution with attendant improvements in flexibility and smooth performance. A newly developed single disc dry plate clutch is now enclosed in a bell housing which carries the transmission case. A pressed steel banjo-type axle with heavier gears mounted on ball bearings throughout and larger brakes completes the power plant, while the front axle has been made heavier to accord with the new spring suspension. The former crosswise steering gear arrangement has been supplanted by a conventional drag link layout.

Five body styles are standard and the black enamel finish which has been characteristic of all but the sport models heretofore has given way to the color possibilities of Duco finish. The black enamel on the radiator shell has been replaced by a nickel finish. However, the shell is not plated but is made of duralumin and therefore is rustproof. The five models with their color schemes are listed as follows:

Touring car, roadster and coach.—The bodies on these three types are finished in dark blue.

Sedan.—This body is finished in aquamarine blue with the upper panels in black.

Coupe.—Upper panels are black while the body is finished in sage green.

Fenders Black Enameled

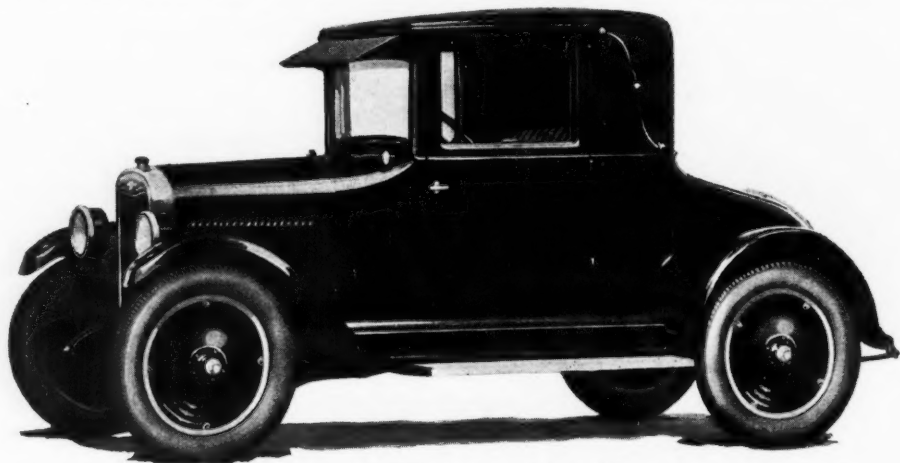
All fenders are black enameled. Black wood wheels fitted with 30x3½ fabric tires on the open cars and cord tires on the closed types are standard equipment. However, disc wheels fitted with 29x4.45 balloon tires are optional at a slight additional cost. All bodies are built by Fisher and the closed bodies are fitted with the one-piece ventilating windshield and automatic cleaner which is controlled at the instrument board. The coach and sedan are equipped with dome lights and the latter has a robe rail at the back of the front seat. Cowl lights are standard on all models. All five-passenger bodies have been made about 3 in. longer with consequent increase in leg-room in both front and rear seats. The rear seat and floor boards have been lowered and the floor board just back of the front seat has been inclined to form a comfortable foot rest. Doors on the closed cars are restrained by an all-

metal strap mechanism which is located at the top. The speedometer and dash lamp are located at the center of a new all-metal Duco-finished instrument board. The switch plate and instruments are arranged symmetrically with them.

Improved Performance Sought

In the redesign of the chassis and power plant the criterions were improved performance in all phases and a greater measure of true service. Under these heads are included riding comfort, ease of handling, smooth power flow for acceleration, protection of all moving parts with consequent longer life, and ease of adjustment of all wearing parts.

With the adoption of the new frame and spring arrangement a low overall height has been maintained by designing a conventional kick-up over the rear axle. A pressed steel cross member which supports the radiator at the front is set just ahead of the drop-forged cross member which is riveted into both side



Three-quarter view of the new Chevrolet coupe

members and forms the front engine support. The third cross member is the pressed steel rear engine support, which is located ahead of the enclosed flywheel. An inverted pressed steel channel at the front anchorage of the rear springs forms the fourth while the fifth is a wide plate at the rear which forms the gasoline tank guard and is riveted into both upper and lower flanges of the side members.

Steering Gear Arrangement Changed

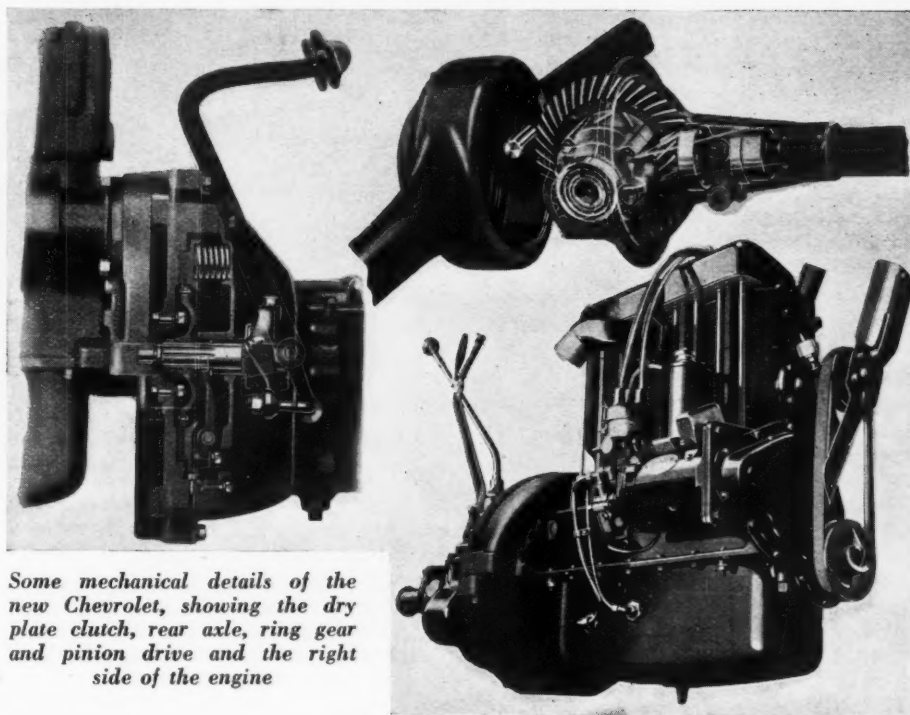
Spring arrangement and anchorages are entirely conventional, with optional drop-forged or malleable cast brackets at both ends of the front springs and for the rear end of the rear springs. The springs are chrome-vanadium alloy and are fitted with bronze bushings in all eyes. Front springs have seven leaves and are 36 in. long and 1 3/4 in. wide. The rear springs, which are nearly flat under rated load, have eight leaves on the touring car and are 54 in. long and 1 3/4 in. wide.

Along with this change to the conventional, the arrangement of the steering gear has been changed in a similar manner. The steering gear proper is applied to the wheel and gear reduction is bracketed to the frame at the rear anchorage for the left front spring. A worm and wheel with complete adjustment of both shafts operates a ball-ended drag link.

Engine Appearance Modified

Rear springs are underslung on a new electrically-welded pressed steel banjo-type axle. The entire differential mechanism is mounted in a carrier which includes the torque tube and this complete unit is bolted to the front face of the banjo. Both the pinion and the differential spider are adjustable and mounted on ball bearings. While the gear ratio, which is 3.82:1, is practically unchanged, the gears have been made much heavier and are spiral bevels. Brakes have been increased in size, the outside dia. of the drums being 11 in.

Externally the appearance of the engine has been modified by the valve and rocker arm covers, the new manifold system and the change to bell housing instead of open flywheel construction which



Some mechanical details of the new Chevrolet, showing the dry plate clutch, rear axle, ring gear and pinion drive and the right side of the engine

involves a change in the mounting of the starting motor. Also, as in the recent cars, a two-bladed fan has been substituted for the former four-blade unit. Lubrication for the rocker arms is provided by thick felt pads which are riveted on the inner upper surface of each cover. These pads are saturated with oil and are of such thickness that contact is made with rocker arms at the valve ends and bearing hubs.

Crankshaft Is Heavier

Although the welded steel tube intake manifold construction has been retained, the vertical leg has been shortened materially and the horizontal branches, formerly straight, have been given a ram's horn effect to prevent loading and deposition. The outstanding effect of the new type is easier starting under cold conditions. Carter and Zenith carburetors are fitted interchangeably although export cars are fitted with the latter make exclusively.

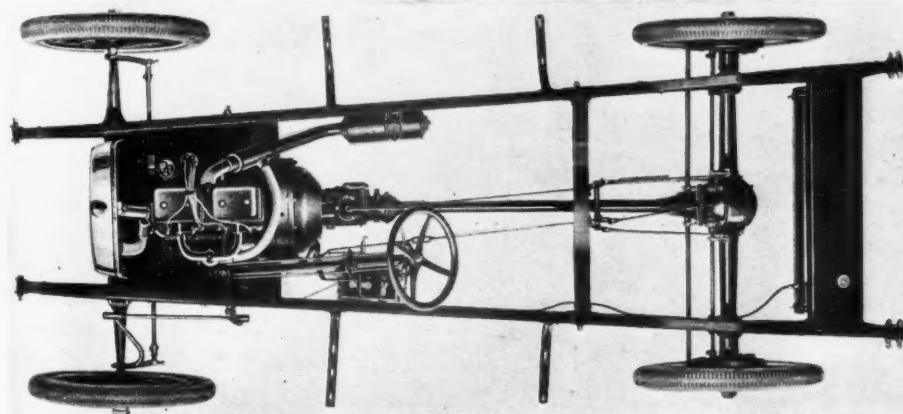
In line with this effort toward greater smoothness, the crankshaft has been

made much heavier in order to eliminate torsional deflection and vibration. Recognizing that the center bearing of a three-bearing engine is subject to the greatest loads due to the fact it carries two cranks in the same radial plane, the designers have mounted this bearing in a bronze back-babbitt lined bearing and provided direct pressure lubrication by means of a copper tube from the oil pump which is mounted on the back end of the generator. The two end bearings, although somewhat greater dia., continue to be mounted in die-cast babbitt bearings with splash lubrication, as has been done by Chevrolet for several years.

The cheeks of the crankshaft have been made much heavier and are now cross-shaped in section. The former light weight connecting rod and thin section cast iron piston are continued although the latter is now equipped with an oil scraper and relief holes at the lower groove. Valves are now made of heat-resisting alloy steel.

Greater Clutch Life Secured

A fully enclosed flywheel construction insures greater clutch life and better performance. The upper half of the bell housing is bolted to the back of the crankcase in place of the former bracket or wishbone and is matched by a lower cast iron cover. The gear box, instead of being carried by brackets of the ear type, is bolted on the back of pressed steel pan or carrier which completes that end of the bell housing. Within this compartment is an entirely new clutch, a single dry plate unit which incorporates a very light rotating member. The friction rings float freely within the clutch; therefore the rotating weight includes only the center spider and four saw steel segments. Each of these saw steel segments is dished slightly to facilitate soft, smooth engagement as the convex



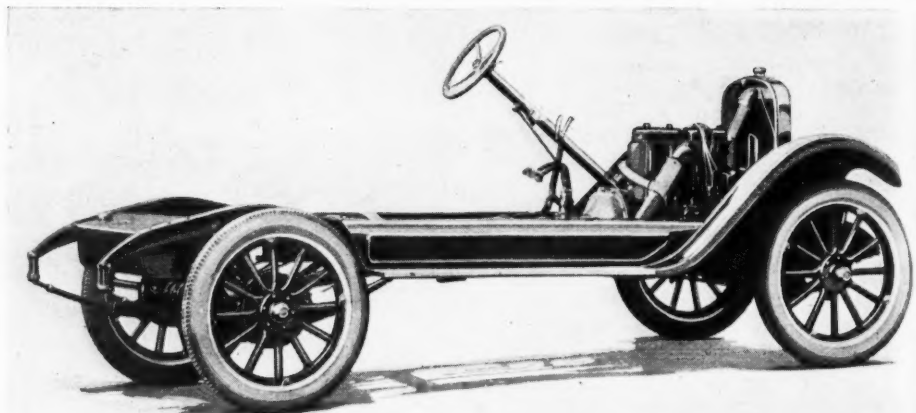
Top view of the new Chevrolet four-cylinder car. This shows the covers over the valve mechanism

portion of the segment is engaged first, after which the entire surface is clamped.

Elimination of internal adjustment was one of the demands of this design, consequently the only owner adjustment is at the short-threaded link which connects the clutch pedal lever with the throwout lever. In a like manner lubrication in the accepted sense has been eliminated. A Durex bearing is installed to pilot the assembly in the rear end of the crankshaft and the clutch throwout bearing is graphite composition.

Speedometer Drive Simplified

Although the exterior of the gear box has been modified appreciably due to the new form of mounting, the interior parts have been changed but slightly. The speedometer drive has been simplified to some extent and the reverse idler pinion is made in one piece where this part formerly consisted of two sections connected by a jaw clutch. The torque tube construction has not been changed. The brake-operating countershaft is mounted in brackets underneath the fourth cross member.



Chevrolet four-cylinder chassis, showing the semi-elliptic springs which replace the former quarter-elliptic type

Fenders retain the characteristic Chevrolet appearance although the shape of the front aprons has been changed to conform to the new frame. Enameled dust guards are placed between the foot board and the body. The engine is protected by dust pans which attach to the

lower flange of the crankcase and the inner faces of the frame side members. The gasoline tank of 10 gal. capacity is suspended by steel straps from the rear cross member while the tire carrier at the rear varies with different bodies and tire equipment.

Many Novel Engineering Features in New Hupp Eight

THE Hupp eight-in-line makes its debut at the New York Show and simultaneously in dealer salesrooms in the larger centers throughout the country. Four body models are included in the line: a phaeton and a roadster, both of which list at \$1,975, and a coupe and a sedan each priced at \$2,325. The engine is an L-head design with 2½ in. bore and 4¾ in. stroke. The car has a 118¼-in. wheelbase. Hydraulic four-wheel brakes and 33x6 in. six-ply balloon tires on natural wood wheels are factory equipment. The weight of the phaeton is 3,135 lbs. The four-cylinder line is continued with detail improvements.

The new engine peaks at 2,700 r. p. m., at which point the output is said to be 63 h.p., and develops its maximum torque of 153 lb. ft. at about 1,000 r. p. m. Among the factors contributing to the smooth performance of the engine are a crankshaft weighing 99½ lbs., light reciprocating parts and accurately machined combustion chambers. The crankshaft is machined all over and put in static and dynamic balance. It is supported in five bronze-backed babbitt bearings of the following dimensions:

	Diameter.	Length.
Front	2½ in.	1½ in.
Nos. 2 and 4	2½ in.	1½ in.
No. 3	2½ in.	1½ in.
Rear	2½ in.	2½ in.

Connecting rods are I-beam section, duralumin forgings. The caps are secured by two ¾-in. nickel steel bolts. In their big ends the rods have spun babbitt bearings 1¼ in. long and 2½ in. in diameter.

Piston pins are ¾ in. in diameter, clamped in the rods, and have their bear-

ings in the piston bosses. The clamping screw is threaded into a tapped steel bushing in the rod which gives a stronger and more durable construction than would be obtained if the threads were cut in the duralumin.

Crank Case Separate Aluminum Casting

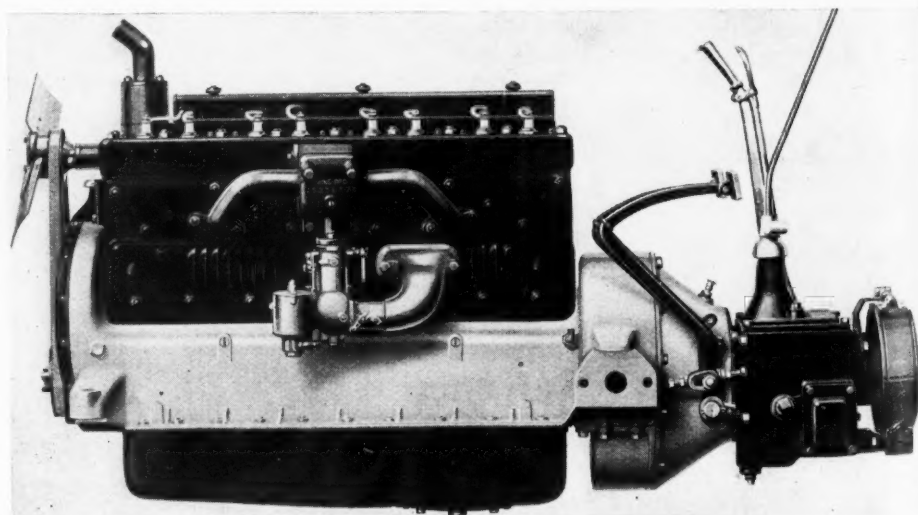
The pistons are permanent mold type, gray iron castings, 3½ in. high and weighing 14 oz. They are held to even weights within .01 lb. and are hand-fitted to the block. There are two plain ½-in. rings above the pin and a 3/16-in. oil ring below. The weight of the connecting rod and piston assembly is 39 oz.

Cylinder block and detachable head are cast of chrome nickel cylinder iron. The

cylinder barrels are honed to a finish and each block is tested for hardness. The combustion chamber is a modified high turbulence type and its volume is about 25 per cent of the piston displacement. The actual compression pressure at 1,000 r. p. m. is approximately 85 lbs.

The crankcase is a separate casting of aluminum with upper portion of the fly-wheel housing integral. The lower portion of this housing is also of aluminum and is secured by studs. The oil pan is of rustproofed pressed steel.

The timing chain compartment cover is a steel stamping and has a dampening plate riveted at about the center of its inner surface to prevent drumming. This stamping also carries the cast aluminum oil filler tube. The timing chain is a



Left side of the Hupmobile straight eight engine, showing the novel method of taking the air into the carburetor from the valve alley

Morse, 1½ in. wide, and is adjusted by means of an eccentric pilot supporting the generator sprocket shaft.

Alloy Steel Valves Used

The camshaft is carried in the left side of the crankcase in five phosphor bronze bushings.

One-piece drop-forged alloy steel valves are used. The intake valves are a chrome nickel alloy and the exhaust valves of a steel containing silicon and chromium. The former have a clear diameter of 1¼ in. and the latter of 13/16 in., the lift being 5/16 in. and seat angle 45 deg. in both cases. Valve stems are 21/64 in. in diameter and operate in cast iron guides 4 7/8 in. long, pressed into the block.

The clearance adjustment is made entirely on the valve stem, the lower end of which is threaded and fitted with a lock nut and a chrome vanadium adjusting nut or thimble.

The valves are set at an angle of 2¾ deg. to the cylinder bore and are operated through the intermediary of rocker arms. This construction is said to reduce the weight of the moving valve parts and also to minimize the side thrust on the valve stems. The rocker arms are chrome vanadium steel forgings, heat treated and case hardened, and assembled in two groups of eight on rocker shafts which are supported by castings mounted on the cylinder block. To insure uniform wear the rocker shoes extend clear across the face of the cams.

Stromberg Carburetor Used

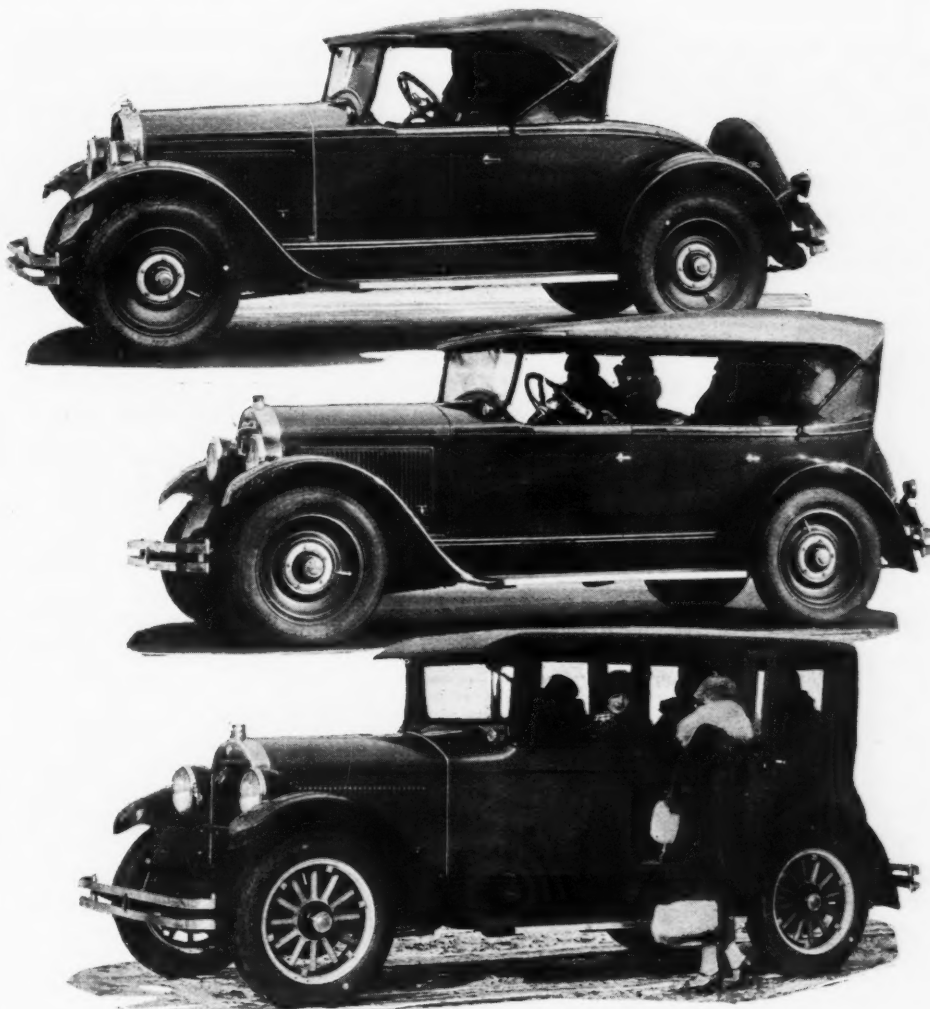
Removal of the pressed steel valve cover plate makes the valve chamber readily accessible for clearance adjustments or for removal of the rocker assemblies. This cover plate incorporates one of the most novel features of the engine as it also serves as an air cleaner and a hot air stove. The carburetor air supply is drawn in through louvres in the face of this plate entering a chamber formed by a stamping which is welded to the inner surface of the cover. The louvres open toward the rear of the car and consequently the air must make a sharp turn to enter them, thus separating the dirt by inertia. As the air chamber is located in the valve alley which is open to the crankcase some preheating is secured.

A short aluminum elbow conducts the air from this chamber to the carburetor, which is a 1¼-in., Model OX-2 Stromberg plain-tube type.

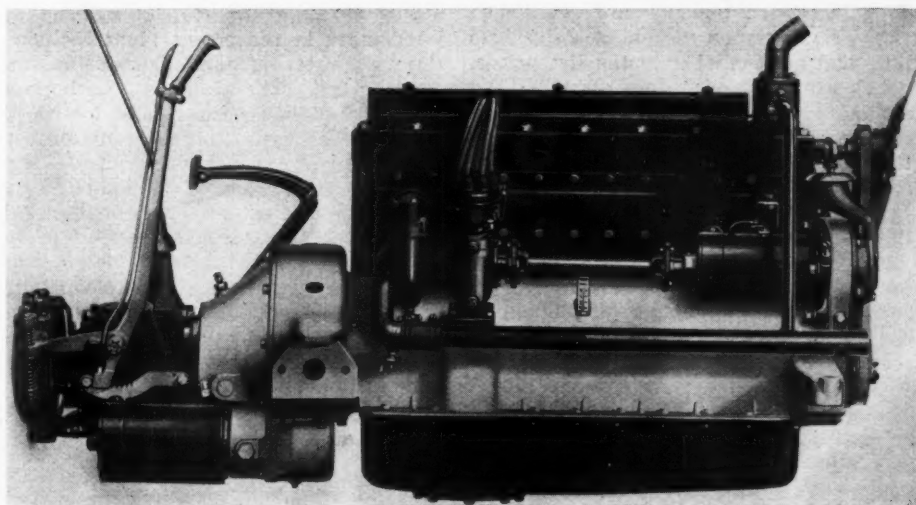
Ignition is by a closed circuit, semi-automatic Atwater-Kent system. The distributor drive is from the rear end of the generator through a short shaft with flexible couplings at each end to a pair of helical gears contained in a cast housing mounted on a bracket cast on the side of the crankcase. The distributor rests on the top of this housing.

Cooling System Has Novel Feature

A novel feature of the cooling system is a pressed steel water-distributing manifold extending the entire length of the right side of the block. The inner



The Hupmobile two-passenger roadster is shown at the top while the other views show the five passenger phaeton and the five passenger sedan. All of these are eight-cylinder models



Right side of the Hupmobile straight eight engine. Note the mounting of the starting motor on the transmission bell housing

wall of this manifold has a number of holes in it through which the water enters the water jackets. The cylinder barrels are entirely surrounded by water, as are the valves, and there is a large water space in the cylinder head over the combustion chambers.

From the outlet at the bottom of the

honeycomb radiator the cooling water is carried back through a steel pipe to the pump, which is supported from the distributor gear housing. The pump is driven from the rear end of the horizontal shaft of the distributor drive, the thrust being taken by a button mounted on the inside of the pump housing. The

pump shaft is of stainless steel. The packing on this shaft is easily adjustable from the outside and the bearing is lubricated by an Alemite fitting. The pump may be removed without disturbing the distributor drive.

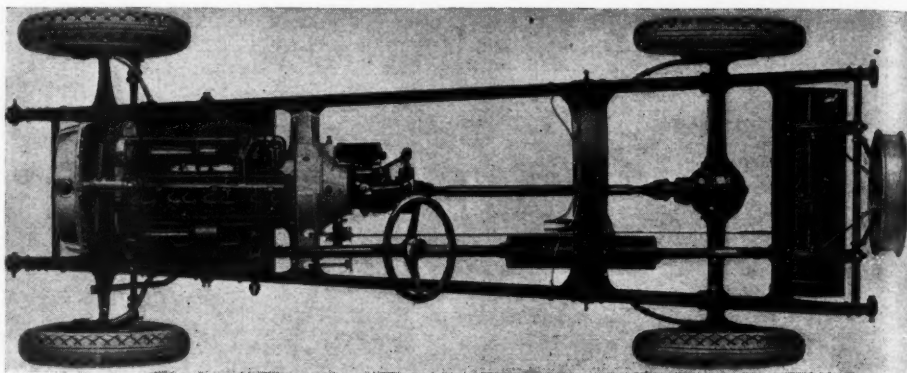
Two Bladed Fan Used

The fan has two blades and its shaft is carried by an adjusting arm from the front of the block. The bearing is cast iron on a hardened steel shaft lubricated from a reservoir contained in the hub.

The water leaves the jackets at the front end of the engine through a syphon thermostatic valve set to open when the water temperature reaches 130 deg., prior to which time the radiator is bypassed.

The large number of points at which positive lubrication is provided is one of the features of the engine. Oil pressure is developed by a gear oil pump located in the oil pan and driven from the lower end of the distributor shaft. This unit is supported from number four main bearing web and may be removed by dropping a plate directly under it on the bottom of the oil pan. It is entirely surrounded by a fine wire mesh screen so that all oil entering it is filtered. On leaving the pump the oil is conducted through drilled ducts to a distributor tube extending the length of the engine and cast in the crankcase. From this tube drilled passages lead to each main bearing. The crankshaft is drilled for pressure lubrication of the connecting rod bearings and the crankpins are bored out.

From the main bearings the oil also



Airplane view of the Hupmobile straight eight chassis, showing the compactness and relatively short length of the power plant

passes through drilled passages to the camshaft bearings and thence through similar ducts to the hollow rocker shafts. The lubricant leaves the latter shafts through radial holes at each rocker bearing. Some of the excess oil at these bearings is discharged through holes drilled in the rocker hubs and flows down the tops of the rocker arms by gravity. A hole drilled in the rocker shoe delivers the oil to the cams. The timing chain is lubricated by overflow from the pressure relief valve, which is located at the front end of the main distributing header. The distributor drive bearing is also lubricated under pressure through

The starting-lighting system includes a storage battery that is exceeded in size on not more than two or three other makes of cars. It is a 6-volt, 17-plate

Willard with an ampere-hour capacity of 155. The starting motor is also of unusual size, showing a lock torque of 34 lb. ft. It is sleeve-mounted on the bell housing and has a Bendix shift. The generator is a third brush type and, like the starting motor, is made by Westinghouse.

Transmission 3-Speed Type

Clutch and transmission are mounted as units with the engine. The former is made by the Long Mfg. Co. The transmission is a three-speed type with annular ball bearings to support the clutch gear shaft and the rear end of the main shaft. The countershaft gears are cut from one forging which rotates on Hyatt roller bearings. The mainshaft pilot is also a Hyatt.

(Continued on next page)

Refined Engine a Feature in Paige

BALLOON tires and de luxe accessory equipment are furnished regularly on the entire Paige 1925 line, and are included in the list prices, which are \$70 higher than in 1924. No changes have been made in the body lines and the chassis remains substantially the same except for a few minor changes. Lockheed hydraulic four-wheel external brakes are offered at an additional cost of \$45.

The 1925 line of bodies and their prices follow: Four-passenger phaeton, \$2,165; seven-passenger phaeton, \$2,165; five-passenger brougham, \$2,395; seven-passenger sedan, \$2,840; seven-passenger

suburban limousine, selling at \$2,965.

Changes in Power Plant

Changes in the power plant include a larger water pump, thermostat and cooling fan. The plain fan bearing formerly used has been replaced with an annular ball type, and the radiator core is thicker. Exhaust valves have been changed to silchrome, a flexible hose replaces the generator spring coupling, and a gear oil pump is used instead of the vane type employed in 1924. The Stewart vacuum system is again regular equipment.

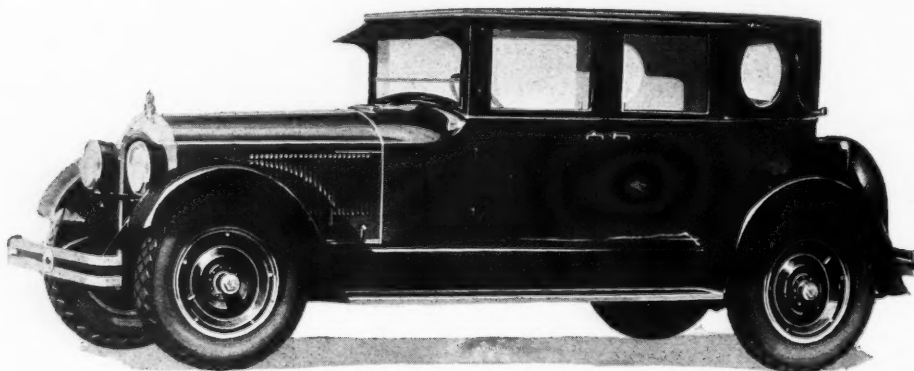
The reduction of the steering gear has been increased and it now is of the worm

and sector type instead of worm and wheel. Front and rear springs have been redesigned for the new tire equipment. The tire size is 33x6.75 in.

The front and rear axles are of Salisbury make and are of approximately the same design used in 1924. The front wheel brake axle has transversely inclined king pins and a heavier section to resist the torsional stresses resulting from the front wheel brakes.

Accessory equipment includes front bumper, rear fender guards, spare tire, nickel radiator, motometer, combination stop and tail lamp, automatic windshield wiper and rear-view mirror. Open models have cowl lights and the sedan and suburban limousine have dome, quarter, and automatic step lights. The latter model also has a concealed speaking tube. Hartford shock absorbers are equipment on the brougham and Gabriel snubbers on all other models.

In the closed bodies the upholstery is mohair, except in the front compartment of the suburban limousine, which has leather. The phaetons are upholstered in leather. The seven-passenger phaeton, limousine and sedan are finished in Bolling green with ivory striping, which the four-passenger phaeton in moleskin gray with carmine stripe, and the brougham in Buckingham gray with French gray stripe.



Here is shown one of the new enclosed models of the Paige line

Straight-A-Way Eight Latest in Apperson Line

INTEREST in the Apperson Automobile Co.'s 1925 line, announced today, centers around the four new straight-away eight models, appearing for the first time at the New York show. The complete line includes fifteen models in three chassis forms: The straight-away eight, the custombuilt V-eight and the super-value eight.

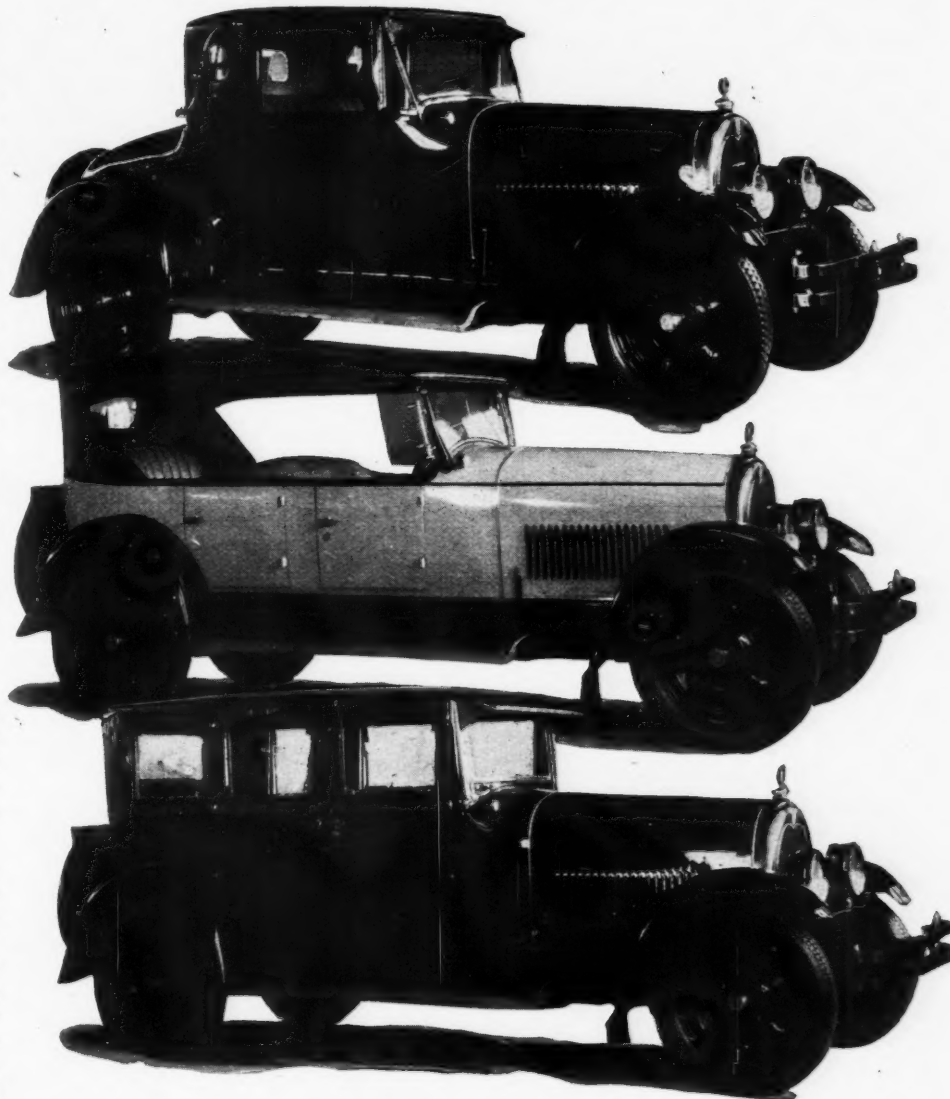
The 1925 production schedule, laid out in two six-month periods, calls for the manufacture of more cars than the company has made in a similar period since 1920. The factory force will be materially increased Jan. 1, with plans for taking on additional men during the month of January. Company officials say that the schedule is based on actual demand. The ratio of closed cars over open models will be greatly increased, according to the plans, due to the strong response on the part of dealers to the new straight-away eight brougham, coupe and sedan. The six-cylinder sedan, which has always been a good seller, is still a strong favorite.

Equipped With Balloon Tires

As is indicated by the names of the three chassis types, the company will not discontinue the manufacture of V-type eights. Eight models of five- and seven-passenger cars are listed under this classification.

All models of the 1925 line carry balloon tires as standard equipment and are equipped with the now well-known mechanical gearshift and dash board emergency brake, which leave the front compartment free from levers. They also have the Apperson safety springs, "burst-proof" radiators and other Apperson features. Bumpers, snubbers, extra tire, nicked head and cowl lamps, nicked steel radiator shell, windshield wiper, rear-view mirror, gasoline gauge, venti-

(Continued on next page)



Three models of the new Apperson straight-away eight. At the top is the coupe; center, the phaeton, and below, the sedan

ENGINEERING FEATURES OF THE HUPP EIGHT

(Continued from page 40)

Power is transmitted to the rear axle by a 2-in. tubular propeller shaft with two ball and trunnion type universal joints. Rear axle torque and propulsion are taken through the springs.

The rear axle is a semi-floating helical bevel design providing a reduction of 4.64 to 1. Axle shafts are supported at their outer ends in taper roller bearings and are removable endwise without disturbing the differential. The spring seats, which are integral with the flanges to which the brake carriers attach, are riveted to the pressed-steel banjo-type axle housing. Drive pinion and its shaft are an integral nickel steel forging. The shaft is straddle-mounted in a double row ball bearing forward and annular ball bearing aft of the pinion. The former bearing is carried in an adjusting sleeve to simplify maintenance.

The front axle is a reverse Elliot type

and has an I-section except at its ends, where it is forged round to give it the torsional strength necessary to withstand the strains imposed by the front-wheel brakes.

Ball Thrust Pivot Bearings

Easy steering with balloon tires has been obtained by the use of ball thrust pivot bearings, transversely inclined king pins and a Ross cam and lever steering gear. The turning radius is 19 ft. in either direction.

Four-wheel external service brakes of the Lockheed hydraulic type are regular equipment. The master cylinder is mounted on the cross member, bracing the frame at the front rear spring hangers. The handbrake acts externally on a drum at the rear of the transmission. The service brake drums are 14 in. in diameter and 2 in. in width.

Semi-elliptic chrome vanadium steel springs are used front and rear, the latter being underslung. The front springs are 37 9/16 in. long by 2 in. wide

and have nine leaves. On the touring and coupe models the rear springs have eight leaves and on the sedan and roadster models nine and seven leaves respectively. The rear springs are 56 1/2 in. long and 2 in. wide on all models. Spring eyes are fitted with phosphor bronze bushings and all spring bolts are 3/4 in. in diameter.

The frame side rails are straight but converge toward the front of the car. There are three pressed steel cross members, the one at the front rear spring supports being a built-up unit, and two tubular members to resist weaving. Provision is made on the frame for mounting front bumper and rear fender guards.

Bodies Are Stream Lined

The four body models are all well stream-lined and a belt line molding beginning at the radiator shell and extending clear around the body accentuates their length. Due to the comparative shortness of the engine, the hood is not disproportionately long.

**STRAIGHT-AWAY EIGHT IS
LATEST IN APPERSON LINE***(Continued from page 41)*

lating eaves, heater, dome light and tonneau lights (closed models) are also standard. Open models are fitted with windshield wings, permanent top and tailored side curtains.

Organization officials regard the new straight-away eight as the most advanced car in the 32 years of the company's existence. In addition to the two lines of eights the company lists three super-value six models. The entire line, with list prices, is as follows:

Apperson Straight-Away Eight	
Sport phaeton	\$2,550
Coupe	2,800
4-door brougham	2,800
Sedan	2,850

Apperson Super-Value Six	
Sport phaeton	\$1,850
Coupe	2,350
Sport sedan	2,395

Apperson Custombuilt V-8	
5-pass. phaeton	\$2,485
7-pass. phaeton	2,535
5-pass. sport phaeton	2,800

7-pass. sport phaeton	2,900
5-pass. sedan	3,485
7-pass. sedan	3,535
5-pass. sport sedan	3,750
7-pass. sport sedan	3,850

The six chassis has a wheelbase of 120 inches, while that of the two eights is 130 inches.

The Apperson company announces a new dealer policy which is said to have attracted a large number of new dealers. The new plan calls for a doing away with the distributor over a large territory in favor of the direct dealer and closer co-operation with him.

New Engine and Redesigned Bodies Feature Jewett

A PRACTICALLY new engine and a completely redesigned line of bodies are the outstanding features of the Jewett Six for 1925. All models are regularly equipped with 31x5.25 in. balloon tires, and Lockheed hydraulic four wheel external brakes are offered at an additional cost of \$40. The line consists of the same seven body models as in 1925 and no changes have been made in the prices except on the standard phaeton, which has been increased from \$1135 to \$1175.

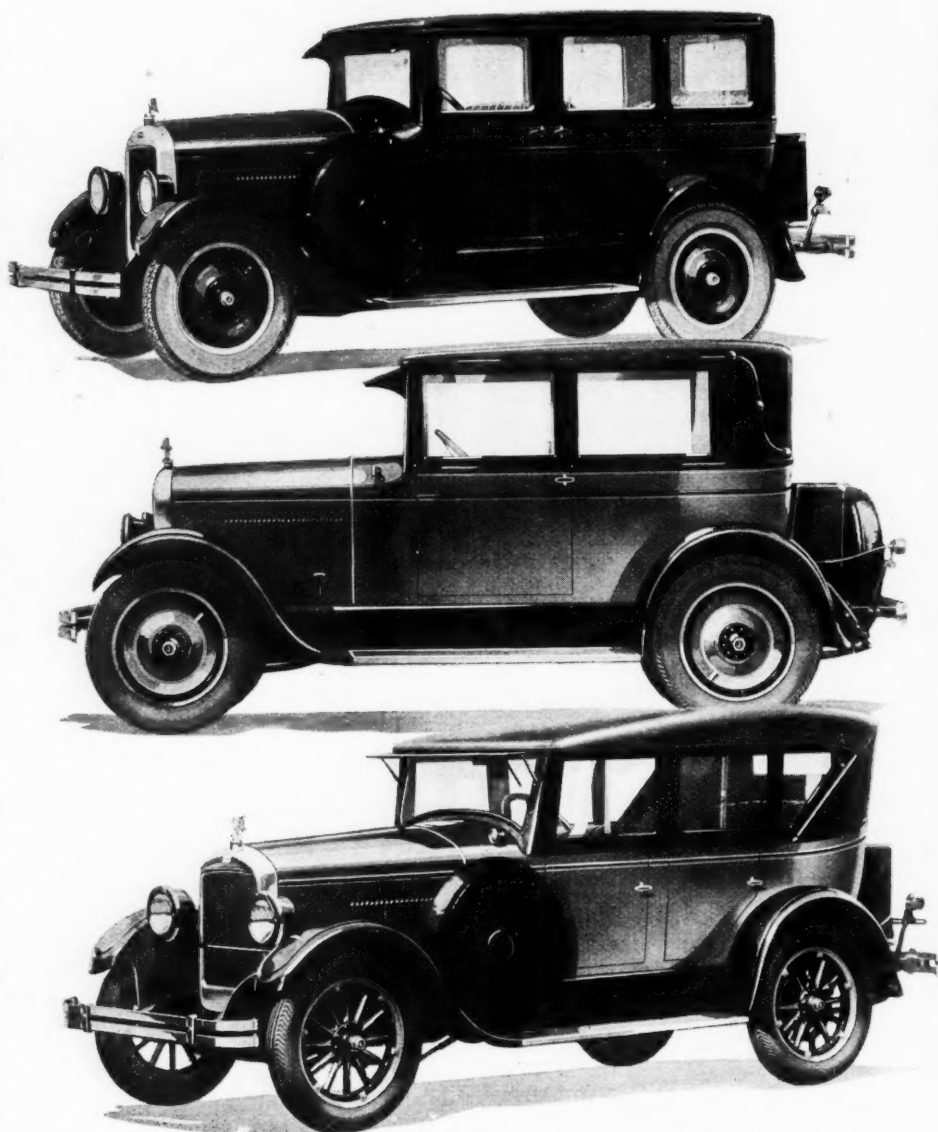
Although the bore and stroke remain $3\frac{1}{4}$ and 5 inches respectively, the changes made in the engine are said to have resulted in a largely increased power output. Smoother performance has been obtained through the use of a counter-balanced crankshaft which is placed in dynamic balance. The new shaft is also stiffer than the old, the diameters of its main journals and crankpins having been increased from $2\frac{1}{8}$ to $2\frac{3}{8}$ in. The three main bearings are now the Chadwick type, which simplifies maintenance, as no fitting is necessary when a replacement is made.

Link Belt Now Used

Skeleton cast iron pistons have replaced the solid type used formerly. The new design is said to permit fitting the pistons with .002 in. clearance, as compared with .003 to .0035 in. required with the former design, and also to facilitate lubrication of the cylinder walls. The piston pin is now clamped in the rod and has its bearing in the piston bosses. Formerly the pin was secured in the piston and had its bearing in the rod.

A Link Belt with automatic spring idler to maintain its tension, has replaced the metallic timing gears used previously. As a result of this change, the distributor, water pump and generator have been transferred to the left side of the engine. With the new layout, the engine is obviously much more accessible, as there is nothing on the valve side but the carbureter.

The capacity of the cooling system is somewhat larger, due to the fact that



Here are shown three of the new Jewett models. Top, the De Luxe sedan; center, De Luxe Brougham and bottom the De Luxe touring

the radiator is 1 in. higher, and the diameters of the outlet and inlet connections have been increased. The stuffing boxes on the pump shaft have been enlarged. The cooling fan is driven from a pulley mounted on an extension

on the front end of the pumpshaft. The generator is strapped in a saddle cast on the side of the crankcase and is driven from the rear end of the pumpshaft through a flexible hose coupling which has replaced the spring of square

section steel formerly used for this purpose.

Manifolding Entirely Redesigned

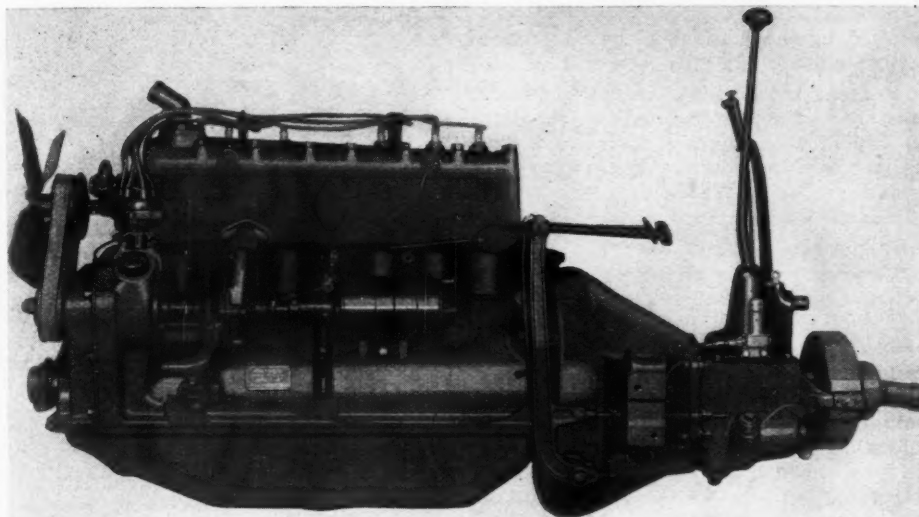
Pressure lubrication is provided at the cam and pumpshaft bearings. The vane type oil pump used in 1924 has been displaced by a gear pump driven off the pumpshaft by helical gears which also drive the distributor. The oil first passes through the pressure relief valve, which is mounted on the side of the crankcase below the water pump, and thence through tubing to each of the main bearings from which ducts drilled in the crankcase webs lead to the camshaft bearings. The oil pump is located in the crankcase and there is no external oil piping on the engine.

The manifolding has been entirely redesigned. Formerly the carburetor was mounted on the left side of the engine and connected with the intake manifold on the right side through a horizontal passage cored in the block. Now it bolts directly to a short riser leading into the intake manifold. The hot spot is located on this riser and some additional heat is applied on the horizontal portions of the manifold. The section of the intake manifold is practically rectangular. The Stewart vacuum system is again regular equipment.

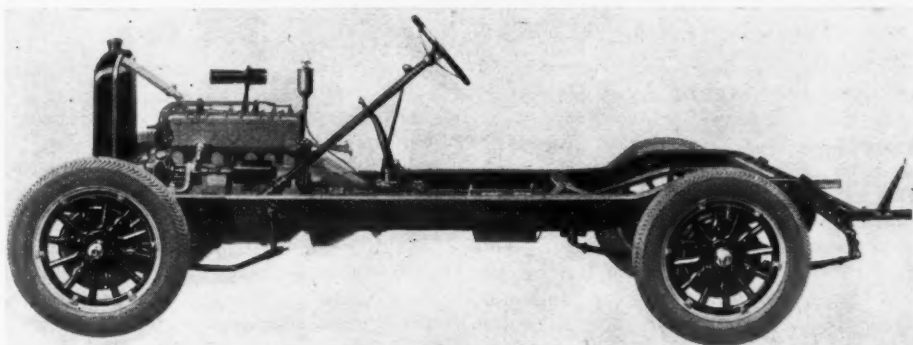
The front and rear axles are of the same general design used in 1924, but are made by the Salisbury Axle Co. With four wheel brakes, a special front axle is furnished. This unit differs from the standard in that the king pins are inclined transversely and the axle forging is heavier to withstand the torsional stresses. A worm and sector steering gear with a larger reduction to give the added leverage needed with balloon tires, is used. The four wheel brake installation is conventional except that the rubber tubes lead to fittings on the axles which are connected by copper tubing to the operating cylinders.

Radiator Is Higher

The new bodies do not differ radically in general appearance from the 1924 line. The radiator is higher and the contour



Left side of the Jewett six-cylinder engine, showing the disposition of the generator, water pump and ignition unit



Side view of the new Jewett chassis, in which several changes have been made in the engine

of its top curve has been altered. The length of the cars is accentuated by lower runningboards and by a belt line molding carried forward to the radiator shell. The closed models also have a second molding around the bases of their superstructures. All models are finished in lacquer, the colors being cobalt blue on the standard jobs, beige brown on the de luxe phaeton and bronze green on the de luxe sedan and brougham. Flush type

cowl ventilators are provided on the entire line. One piece windshields are used and on the closed models they may be raised 1 in. vertically and then swung outward if desired. In the standard sedan and brougham the upholstery is chase millaise and in the de luxe closed models chase mohair velvet. The body framework has been strengthened by the use of a better grade of hardwood, larger posts and heavier metal fittings.

Overland and Willys-Knight Both Announce Six-Cylinder Models

WILLYS-OVERLAND, Inc., has broadened its market by the introduction of new Overland and Willys-Knight six-cylinder chassis models. The former has an L-head engine with 3-in. bore and 4-in. stroke, and the latter a 3¼x4¼-in. Knight power plant. The wheelbase lengths are 112¼ and 126 in. respectively. Balloon tires are furnished on both models, and the Knight six is equipped with mechanically operated four wheel brakes and the Skinner oil rectifying system.

A unique feature of the Overland Six line is that it consists of a coach at \$985 and a sedan at \$1,150, no open bodies

being offered on this chassis. The Knight Six line is made up of roadster, phaeton, coupe, coupe-sedan, sedan and brougham.

The four-cylinder Overland and Knight models are continued without change except that the radiator and hood lines of the latter have been altered slightly to conform with the appearance of the new Knight Six.

The piston displacement of the Knight six-cylinder engine is 236.4 cu. in. and it is said to develop 60 hp. at 2800 r.p.m.

It differs from the Knight four in a number of important respects such as the cooling and lubrication systems, the cylinder head construction and the mani-

folding. It has a dynamically balanced crankshaft supported in seven Chadwick type, bronze-backed babbitt bearings.

Crankcase of Aluminum

The engine is supported at the rear by two arms extending out from the flywheel housing, which is integral with the crankcase, and at the front, by the timing chain cover. Both the oil pan and crankcase are aluminum and the latter casting is carried 2¼ in. below the center line of the crankshaft for stiffness. The oil pan has a false bottom in which there is a large screened opening through which the oil filters into the reservoir

formed by the bottom of the pan. The cylinder block is a gray iron casting.

Tubular section steel connecting rods are used. The piston pins are locked in the upper ends and have their bearing in bronze bushings in the split skirt aluminum pistons. There are three plain rings and one oil type, all located above the pin.

Cooling water is circulated by a centrifugal pump housed in the front end of the cylinder block. To provide a tension adjustment on the fan belt, the pump body is piloted eccentrically in the block. The new heads are permanent mold, aluminum castings and are secured to the block by studs. An annular water space is provided in them which is divided into right and left sections by vertical baffles. The two sections are connected by openings at the bottoms of the baffles. The tops of the baffles register closely with a longitudinal web on the inside of the cylinder cover, which divides the water space over the heads into right and left compartments.

Sealing Ring of New Design

Water enters the right compartment from the cylinder block and is deflected downward into the aluminum heads by the web on the cylinder cover. It flows down the right sides of the cylinder heads, through the openings at the bottom of the baffles and then up on the left into the water space over the heads, thus giving a continuous flow of water past the walls of the combustion chambers.

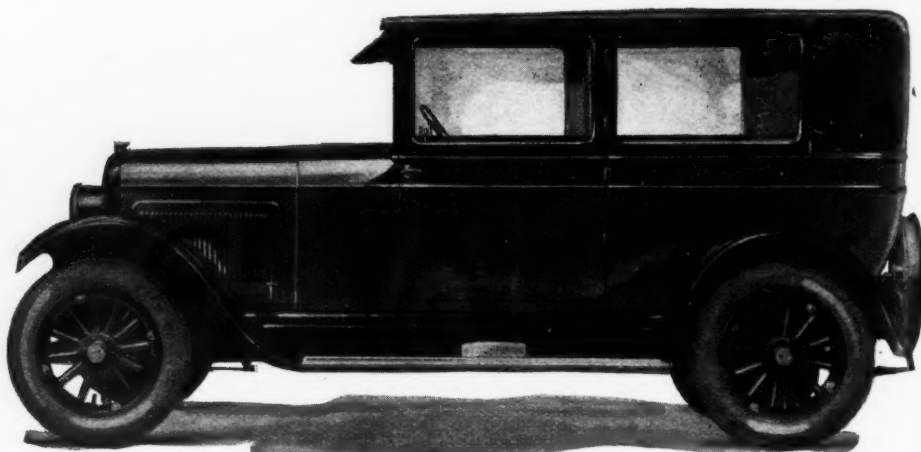
The sealing ring used in this engine is also a new design. Its inner surface is grooved and the lands thus formed fit into grooves on the lower end of the head casting. The tortuous passage at the back of the ring gives an efficient seal, and the many shoulders increase the bearing surface available for taking thrust.

A Link-Belt chain with automatic spring idler, drives the generator and the eccentric shaft. The latter is a drop forging supported in eight die-cast white metal bearings. The two center bearings on this shaft straddle the helical pinion which drives the oil pump and distributor.

The oil pump is supported from the center main bearing web. It is a gear type but differs from the conventional in that the pumpshaft drives an internal gear which meshes with a pinion mounted eccentrically in the pump housing. The oil is distributed to each of the main bearings by a manifold supported from the bearing caps and passes to the crankpins through ducts drilled in the crankshaft. Oil under pressure also is supplied at the eccentric shaft bearings, the generator drive shaft bearing and the idler sprocket. The chain is lubricated by oil discharged through radial holes in the idler sprocket.

Auto-Lite System Used

The oil rectifier is mounted on the exhaust manifold and draws oil of the pistons through small openings in the



Side view of the new Overland six-cylinder coach

sleeves which register with each other in the same manner as the valve ports. A Staynew air cleaner is furnished on this engine.

A six-volt, single wire Auto-Lite system consisting of starting motor with Bendix pinion, third brush generator and semi-automatic distributor is standard equipment. The battery is a USL of 170 amp. hr. capacity which is unusually large considering the piston displacement of the engine.

Clutch and transmission are mounted as units with the power plant. Both of these units are similar to those used on the Knight four except that the clutch has 14 instead of 10 plates. The drive to the rear axle is through a 2-in. tubular propeller shaft with oil type, Mechanics Machine universals at either ends. The rear axle is a three-quarter-floating, helical bevel unit with a 5.11 to 1 reduction, and is the same as the axle used in the Knight four except for dimensional differences. Rear axle torque and propulsion are taken through the rear springs, which are 57½ in. long by 2¼ in. wide. The front springs are 36½x2¼ in.

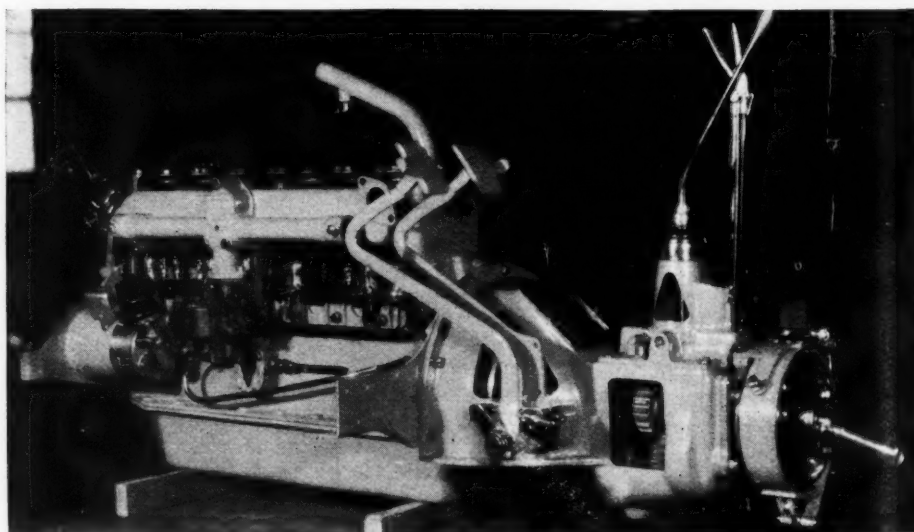
Front Brakes of Internal Design

The front-wheel brakes differ radically

from any design in use in this country. The braking force is transmitted from the pedal by a rod leading to a lever supported by a bracket attached to the front axle. This lever is mounted on a floating equalizer in the bracket. Pull rods extend from the equalizer to yokes carrying rollers located in the brakes proper. The yokes are fitted with ball joints to permit universal action necessary to steering and braking.

The front brakes are an internal design with two cast aluminum shoes anchored at the top. The operating rollers are located in wedge-shaped spaces formed by the curved lower ends of the shoes. When the brakes are applied, the rollers are drawn in toward the center of the front axle thus forcing the shoes outward into contact with the drums. The forces applied to each brake are equal as, due to the action of the floating equalizer, one is a reaction of the other. A wedge adjustment manipulated by a screw, is provided at the fixed ends of the shoes.

The front axle is a reverse Elliott type with taper roller bearings at the upper and lower pivots. It is of the same design used in the Knight four except that the king pins are inclined transversely



Powerplant of the new Overland six-cylinder model, showing the arms for mounting in the frame

and the axle forging has been strengthened to withstand torsional stresses caused by the front wheel brakes. The steering gear is a worm and sector type with a reduction of $11\frac{1}{2}$ to 1. Tires are 32x6.20 in., six ply balloons on rims 5 in. wide.

New Overland Chassis

Turning to the new Overland chassis, its engine has a piston displacement of 169.6 cu. in. and its output is given as 40 hp. at 2600 r.p.m. The cylinder block and detachable head are gray iron castings. The crankcase is integral with the former and extends 2 in. below the axis of the crankshaft. The oil pan is pressed steel. The crankshaft is supported in three Chadwick type bearings. The connecting rods are I-section steel forgings. The big end bearings are babbitted in place and are $1\frac{1}{2}$ in. in diameter and $1\frac{1}{2}$ in. long. The piston pins are clamped in the rods and have their bearing directly in the bosses of the split skirt, aluminum pistons. There are three plain rings, all above the pin.

The camshaft and generator are driven by a train of three helical gears, the camshaft gear being of Textolite and the other two of steel. The camshaft is supported in four bearings all of which are die-cast white metal except the front which is cast iron. As in the Knight Six, the two center bearings straddle the helical pinion driving the oil pump. In this engine, however, the driveshaft is horizontal and the pump is contained in a housing piloted and studded to the outside of the crankcase on the left. The distributor drive is taken from the rear end of the generator.

The pump draws oil from the reservoir in the base of the crankcase through a screen clamped to the end of the intake pipe. A tube leads from the pump to the rear main bearing from which point oil is distributed through passages drilled in the crankshaft to the front and center main bearings, the crank pins and the timing gears. The camshaft bearings are lubricated by ducts in the webs connecting them to the main bearings.

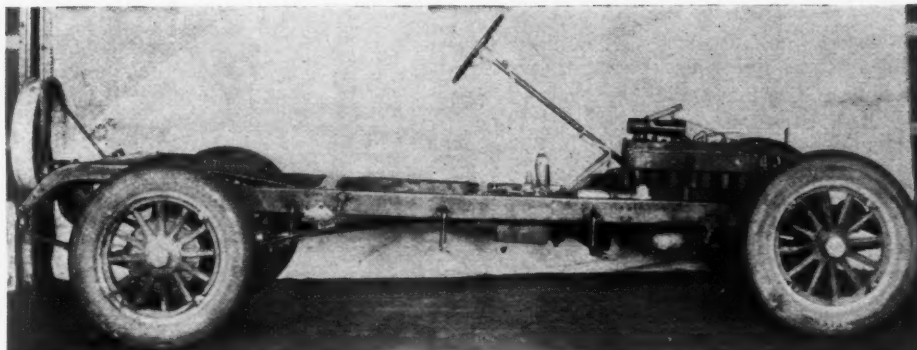
Cooling water is circulated positively by a centrifugal pump mounted on the front of the cylinder block in much the same manner as in the Knight Six. The fan bearing in this engine, however, is an annular ball. The water outlet from the engine is at the rear of the cylinder head. Ample water spaces are provided around all cylinder barrels and valve ports.

The valves have a clear diameter of $1\frac{1}{4}$ in. and a lift of $\frac{1}{8}$ in. They are operated through mushroom tappets which are assembled in groups of six in removable guide blocks.

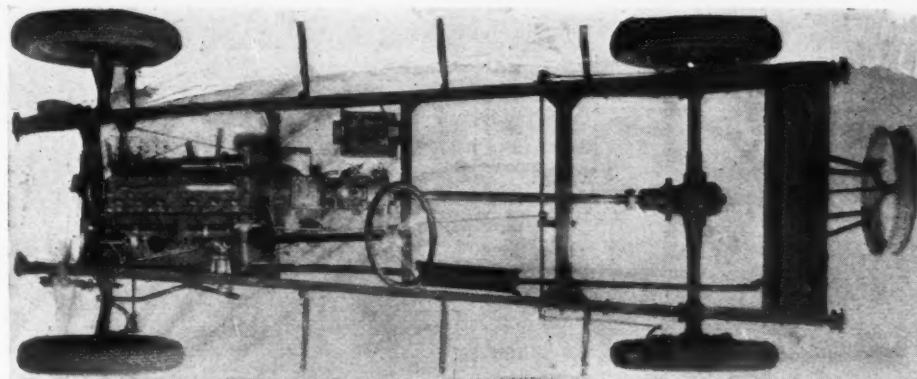
Intake Manifold Design

The engine is supported by two transverse steel plates the ends of which bolt to brackets riveted to the frame side rails.

The intake manifold is a straight, round section design with sharp right angle bends to assist vaporization of the



The new Overland Six chassis. Semi-elliptic springs are used front and rear



Plan view of the Overland six-cylinder chassis

fuel. It is supported centrally from the exhaust manifold and at its ends from the cylinder block. The heating jacket is cast integrally with it and the entrance to it registers with a companion opening in the exhaust manifold. The hot spot is located directly above the vertical riser from the carburetor. On leaving the manifold, the mixture travels through passages cored in the exhaust manifold which lead to the intake ports.

The electrical equipment consists of Auto-Lite starter, third brush generator, semi-automatic distributor and 80 amp. hr. USL battery.

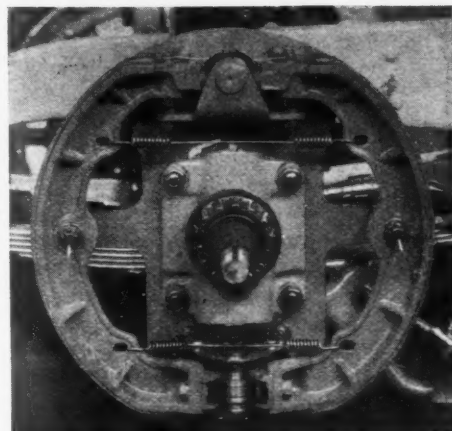
Clutch and transmission are supported from the rear end of the engine by a bell housing cast integral with the gearbox. As in the Knight Six, both units are similar in design to those used on the Knight

four except that the clutch has eight plates. The drive to the rear axle is through two metallic universal joints and a $1\frac{3}{4}$ in. tubular propeller shaft.

Rear Axle Semi-Floating

The rear axle is a new Overland semi-floating design with helical bevel gears giving a reduction of 5.11 to 1. The differential housing consists of two malleable iron castings bolted together. The axle tubes are riveted to these castings. Pinion and shaft are an integral forging supported in a double row ball bearing at the front and an annular ball at the rear. The former bearing is carried in a cage which is screwed and locked in the pinion shaft carrier. This construction simplifies the adjustment for pinion clearance. The differential is supported in roller bearings and may be adjusted transversely through openings in the rear of the differential housing which give access to the nuts securing the bearing cages. The outer ends of the axle shafts are supported by annular ball bearings.

The service brakes act externally on $12\frac{3}{4}$ x $1\frac{1}{4}$ in. drums on the rear wheels and the hand brake is a contracting type mounted on the rear end of the transmission. The springs are semi-elliptic front and rear, and rear axle torque and propulsion are taken through them. The spring lengths are 34 $\frac{3}{4}$ and 53 in. front and rear respectively. The steering gear is a worm and wheel unit similar in design to the one used on the Knight Four. The front axle is an Elliot type with vertical king pins which are secured in the



A close-up of the front wheel brake on the Willys-Knight six

axle eyes. The pivot bearings are lubricated by cups mounted on the tops of the pins. The thrust is taken by washers. The tires are 31x5.25 in., six ply balloons on 4½ in. rims.

Adequate road lighting under all conditions without inconvenience to drivers of passing cars, has been provided on the Willys-Knight Six in a novel manner. The head lamps are equipped with double filament bulbs, the upper filaments providing the glareless illumination required when passing cars.

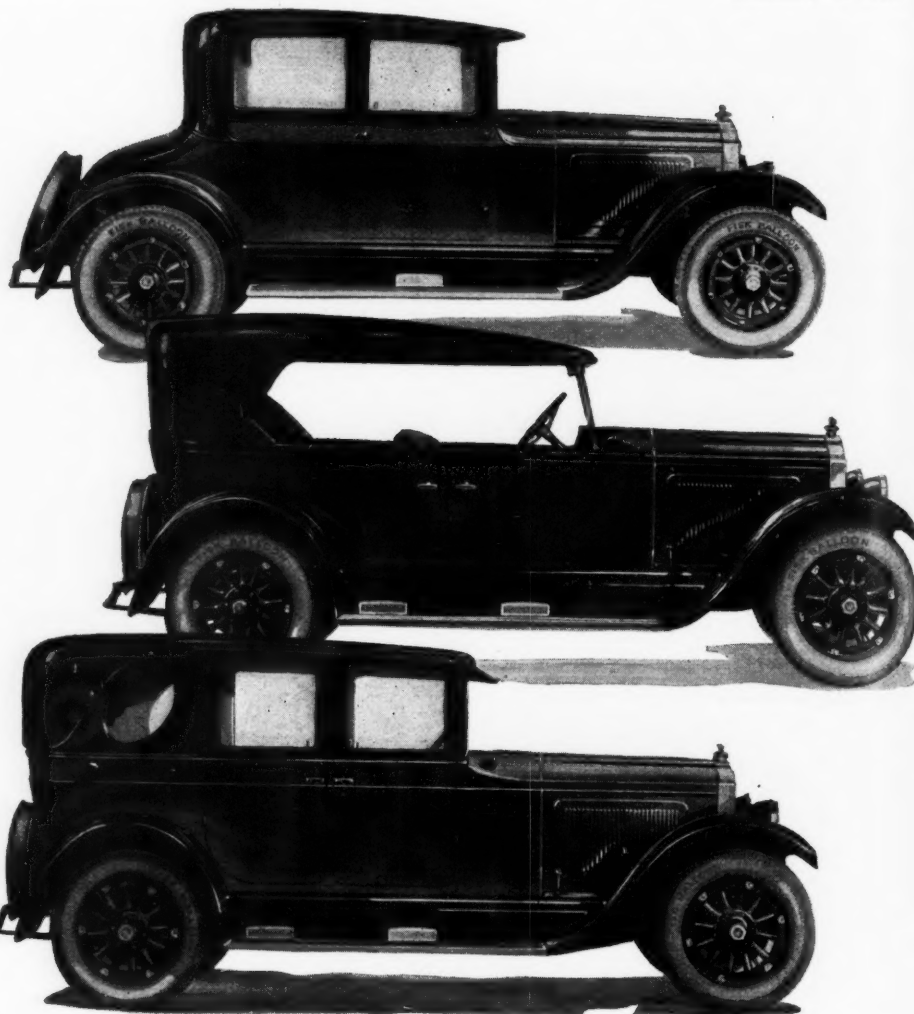
Directly below the left headlamp, there is a spot light. Half of this lamp is shielded and it is aimed so that its rays fall on the right side of the road. When the lighting switch is turned to the dim position, the upper filaments of the lamps are used and the spotlight is thrown on automatically at the same time.

The lighting switch is located in a position convenient to the driver's right hand on the end of an arm mounted on the steering column. This arm also carries the horn button. In addition to the usual instruments and controls, the instrument board carries a clock and a gasoline gage. It is illuminated by a lamp concealed in the cowl. Watson stabilizers, front and rear, are furnished on all models of the Knight Six line.

Two Tone Color on Bodies

The bodies on the Knight Six chassis are finished in varying shades of gray. The phaeton and roadster are done in a two-tone combination with leather upholstery to match and walnut finish wheel spokes and body moldings. The roadster has a permanent top and rumble seat for two in the rear deck. Both open models are equipped with two-piece windshields, rear view mirrors, and windshield wipers.

Sedan and brougham are also finished in two-tone gray, the panel formed by the double belt line bead molding being a darker shade. The tops are lack and the wheels are finished to match the body



Three of the Willys-Knight six-cylinder models, showing from top to bottom the coupe, touring and brougham

color. The upholstery is velvet mohair and Marshall type springs are used in the seat cushions. These bodies are equipped with dome lamp, quarter lamps, foot lamp, heater, toilet case, rear vision mirror, one-piece windshield, and automatic wiper. The coupe and coupe-sedan are finished in Katahdin gray below the belt and black above. The former model has a large luggage space in the rear

deck and the latter is equipped with a trunk.

On the Overland Six chassis, the sedan is finished in peacock blue below the belt and dustproof gray above with velour upholstery in a harmonizing shade. The two-door sedan is a coach type. It is finished in black lacquer with gold striping. The rear quarters are covered with black Fabrikoid.

Rickenbacker Six Design Conforms Closely to Eight

THE Rickenbacker six cylinder line is continued for 1925 with a larger and materially improved engine. Prices on the sport phaeton, coupe and sedan have been reduced \$200 and a new four door, five passenger coach-brougham priced at \$1,595, has been added. The price on the roadster remains at \$1,595 but, in the future, it will be built only on order. A coach-brougham listing at \$2,395 has also been added to the Vertical Eight line which otherwise is continued without change. Balloon tires are

standard equipment on the six and optional at no extra cost on the eight.

As a result of the changes made in the six, its design conforms very closely to the eight and many of the parts in the two engines are now interchangeable. The latter fact obviously tends toward more economical manufacture and also reduces factory and dealer service costs. The extent to which interchangeability has been carried is indicated by the fact that such parts and assemblies of the six as the main bear-

ings, connecting rods, oil pump, fan bracket, flywheel, valves, tappets, valve springs, timing chain compartment cover, and flywheel housing, are now exactly the same as in the eight.

The piston displacement of the engine has been raised from 218.6 to 236.4 cu. in. by an increase in the cylinder diameter from 3½ to 3¾ in. with the result that the car is now said to be able practically to duplicate the acceleration of the eight.

The engine is also said to operate more smoothly at all speeds due partly to the

increase of main journals and crankpins to 2 9/16 and 2 in. respectively. Another factor contributing to smoothness in the greater accuracy with which the combustion chambers are machined, the surfaces now being profiled as in the eight cylinder engine.

Camshaft Lubrication Novel

The novel method of camshaft lubrication employed in the eight, has been incorporated in the six cylinder engine. The shaft is supported in six bearings in a longitudinal compartment which is design. The new shaft is, in addition, considerably stronger than the old because of an increase in the diameter of change from a three bearing crankshaft to a dynamically balanced, seven bearing maintained full of oil by overflow from the pressure relief valve and by splash from the crankcase. The inner wall of this compartment is of such height that the camshaft operates continuously in a bath of oil. Excess oil spills over the inner wall of the compartment and drains back to the crankcase.

The valves in the six now are inclined at an angle of 3 deg. to the cylinder bores as in the eight. The cast iron pistons are 4 1/4 in. high and have three rings above the pin and an oil ring below.

A new design of centrifugal water pump has been adopted on the six. As in the past, the pump is driven from the rear end of the generator. To provide for relative motion between it and the block, novel flexible connection in the form of a bellows with integral flanges on each end for attachment is installed.

Increase Steering Gear Reduction

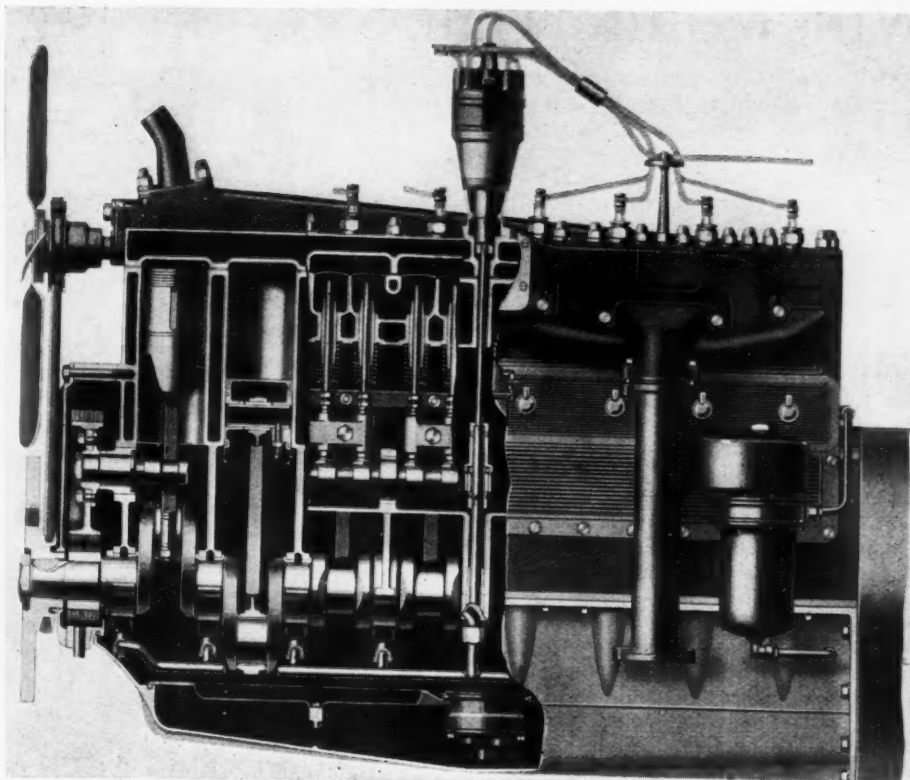
The manifolding on the six has been redesigned and is now similar to the eight. The hot spot is formed by chamber surrounding the center of the intake manifold and connecting with the exhaust manifold.

No changes have been made in the chassis except an increase in the steering gear reduction to give easier steering with balloon tires. On the six the tire size is 31x5.25 and on the eight either 32x5.77 balloons or 33x4 1/3 high pressure cords. Natural finish wood wheels are furnished on all models of the six cylinder line except the coupe and sedan which are equipped with steel disk wheels as are the eight cylinder models.

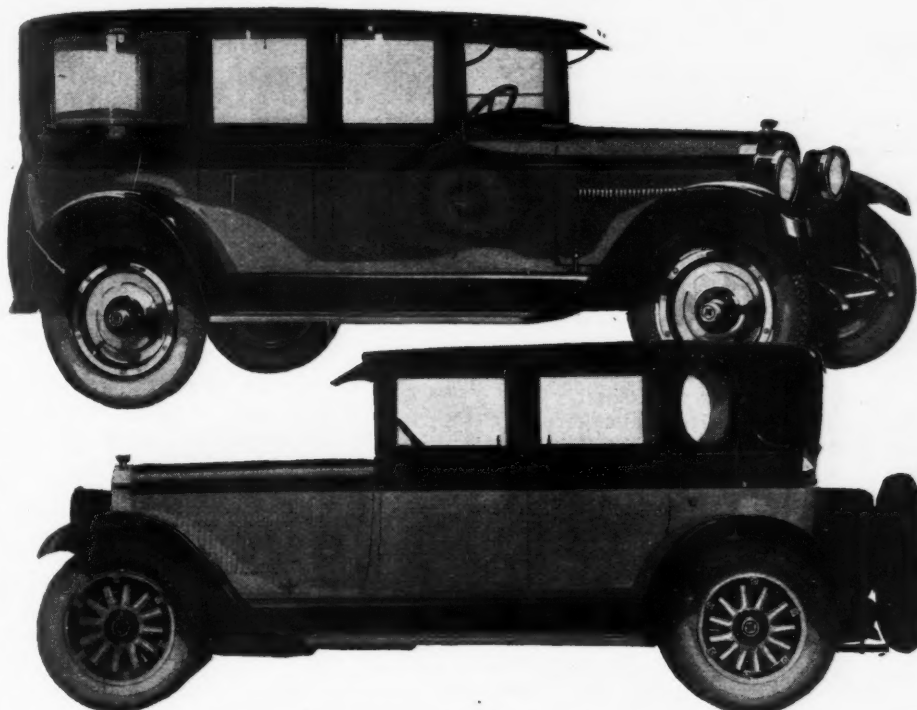
An option of either duco or varnish is offered on all models except the coach-broughams on which the lacquer finish is standard. The six bodies are all done in the popular two-tone color scheme, with the darker shade covering the top of the hood and forming a belt line panel extending clear around the bodies.

Five Passenger Coach Brougham

The coach-broughams are comfortable five-passenger, four door closed bodies.



Partly sectional view of the Rickenbacker vertical eight engine. This shows the method of driving the distributor



Above is shown the Rickenbacker six-cylinder sedan and the six-cylinder coach brougham

The rear quarters are covered with leather and have vertical oval windows and landau iron. Space is provided at the rear for a trunk which is included in the equipment of the eight. The upholstery is tan worsted in a shade to match the exterior finish.

Equipment on the eight coach-

brougham includes front bumper, rear fender guards, Hartford shock absorbers front and rear, clock, motometer, wing radiator cap and lock, stop light, vanity cases, automatic windshield wiper, rear-view mirror, sun visor and disk wheels. The finish on this model is two-tone blue Duco.

Wills Sainte Claire Six in Eight Body Styles

THE new Wills Sainte Claire Six, making its initial appearance at the New York Show, is featured by an overhead valve, overhead camshaft engine with a $3\frac{1}{4}$ in. bore and $5\frac{1}{2}$ in. stroke giving it a piston displacement of 273 cu. in. The line consists of roadster, Gray Goose Traveler (a five-passenger phaeton), seven-passenger phaeton, four-passenger coupe, four-door brougham, five-passenger sedan, seven-passenger sedan, and enclosed drive limousine, all of which are mounted on a standard 128-in. wheelbase chassis. The new model is in addition to the present eight cylinder line which is continued with new and more luxurious bodies. No announcement concerning prices on either line has been made.

From the standpoint of appearance, the new cars resemble the eight, the wheelbases being identical and the body and hood lines substantially the same. The two chassis are also very similar except, of course, for the power plants although many of the features of the eight such as the method of valve actuation, the camshaft steadying device and the fan drive, are found in the six-cylinder engine.

Suspended at Four Points

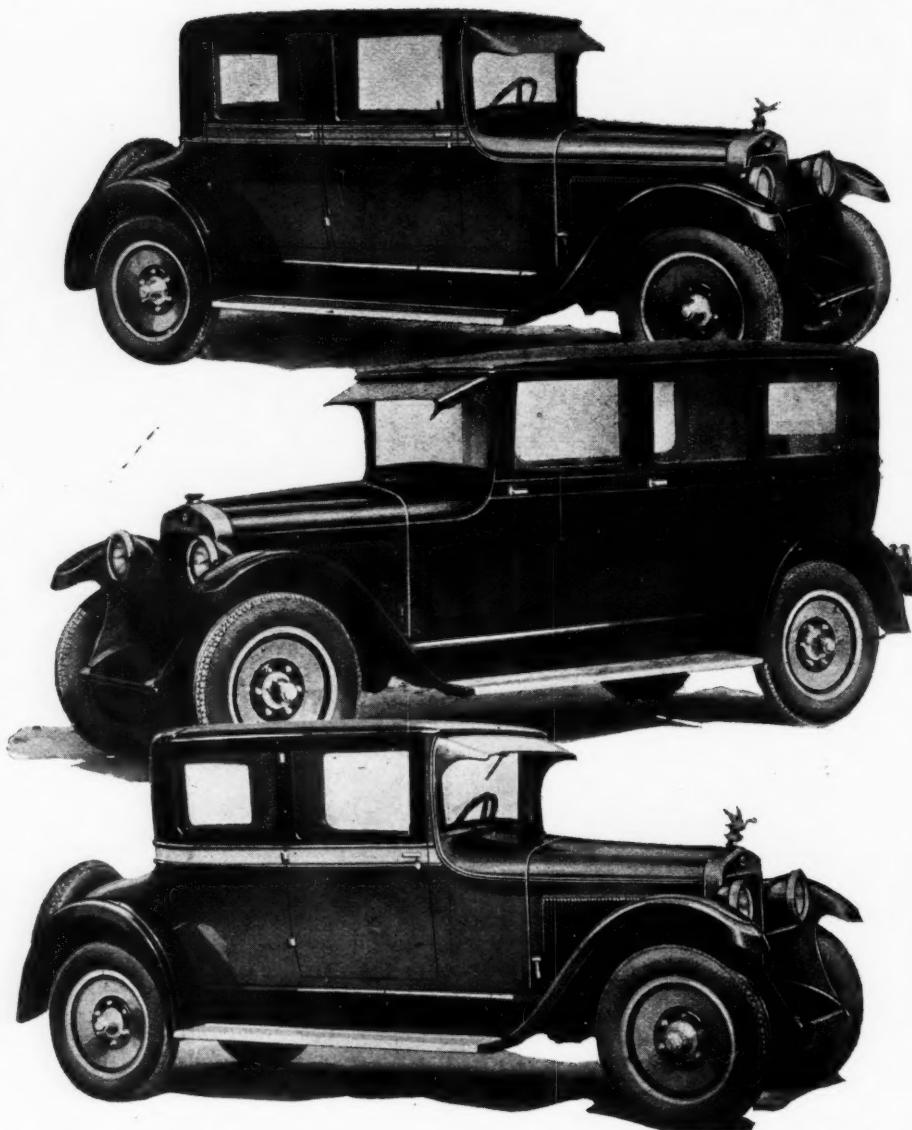
The new engine presents as unusually smooth and clean appearance. It is suspended at four points, rubber cushioning blocks being provided at the two front supports. The cylinder block, upper crankcase and upper portion of the flywheel housing form a single gray iron casting. The four engine supporting arms are integral with this casting, the two at the rear extending out from the flywheel housing. The starting motor has a sleeve mounting on the left side of this housing.

The lower portion of the flywheel housing and the lower crankcase form an integral aluminum casting. This part is bolted to the upper crankcase, the joint between the two coming at the level of the center line of the crankshaft. The crankcase is pressed steel and is secured to the lower crankcase by studs.

The detachable cylinder head and the housing for the overhead valves are also gray iron casting. The cylinder head hold-down studs are seated in the head and extend down through holes drilled in the water jacket walls of the block. Recesses are provided in the block walls to give clearance for the nuts on the ends of these studs. The advantage of this construction is that, when these nuts are tightened, the strain is on the water jacket wall and not on the cylinder wall where it would tend to cause objectionable distortion of the barrels.

Crankshaft Heavy Forging

The combustion chambers are completely machined and are contained entirely in the head casting, the top of the piston being level with the split in the head at the upper dead center position. With this design, the cylinder bar-



The bodies of the new Wills Sainte Claire six resemble very closely those of the eight-cylinder models. Top to bottom: four-passenger brougham, seven-passenger brougham and four-passenger coupe

rels are not exposed to the high temperatures existing during combustion and consequently the possibility of their being distorted out of round by unequal expansion is reduced.

Seven bronze-backed, babbitt-lined, shimless type bearings support the crankshaft which is a very heavy forging, its weight being about 77 lbs. It is machined all over and put in static and dynamic balance. The connecting rods are of aluminum alloy with babbitt bearings at their big ends. Pistons are cast iron with two plain rings above the pin and an oil ring below, the base of the groove for the latter ring having oil relief holes drilled in it.

The overhead camshaft is carried in four main bearings which are supported in the cast valve housing. The thrust is taken at the front bearing by washers. On the rear of the camshaft there is a friction steadying device of the same type used in the eight. The camshaft drive is through helical bevel gears from the

front end of the crankshaft to an enclosed vertical shaft at the front of the engine and thence through a second set of helical bevel gears to the camshaft. The vertical shaft is, in two pieces connected by an Oldham coupling which can be put together only in one way thus avoiding the necessity of retiming the valves when the head is removed for maintenance work. The lower portion of this shaft is carried in two bronze bushings mounted in a cast housing which is studded and piloted to the upper crankcase. The upper portion is mounted in two bronze bushings supported by the overhead valve housing. Thrust on this shaft is taken by washers.

Feature of Circulating System

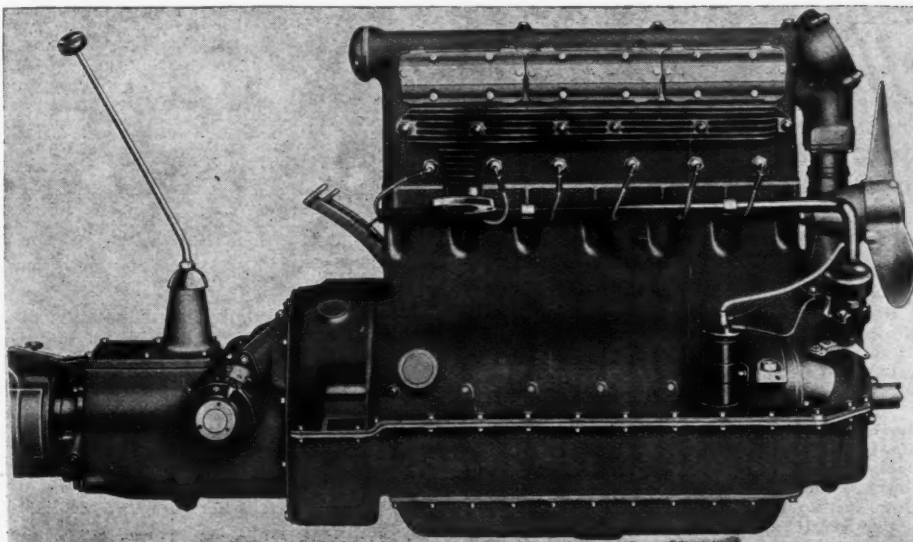
The valves are arranged vertically along the center line of the cylinder block. Valve stem guides are of cast iron pressed into the head casting and the valve spring retainer is secured with a split washer. The actuation of the valves

is through rocker arms in the same manner as in the eight-cylinder engine. The rockers are bronze bushed and are carried by lapped shafts supported from cover plates on the right side of the valve housing. When these plates are removed, the tappet assemblies come with them. To make valve clearance adjustments the two cover plates on the left side of the valve housing are removed.

Cooling water is circulated by thermosiphon. A novel feature of the circulating system is that the water enters the right front engine supporting arm and travels the length of the engine through a cored passage in the upper crankcase entering the water jacket at the rear. An advantage advanced for this construction is that it provides cooling for the oil in the crankcase. Each cylinder barrel is entirely surrounded by water and the same is true of the valve ports. The water outlet is on the left side of the head at the front. The fan is of die-cast aluminum and is a three-bladed design with airplane propeller type blades. It is driven through helical gears from the vertical shaft at the front of the engine and is provided with the same type of automatic governing mechanism used on the eight. This device cuts out the fan drive at about 35 m. p. h. in high gear.

The carburetor bolts to a flange on a cast aluminum, water packeted manifold which is secured to the head by studs. This manifold has a substantially square section and is surrounded by water.

Clutch and three speed transmission are supported from the flywheel housing. The bell housing is a separate casting and has the generator mounted on its right side. The drive for this unit is



Right side of the new Wills Sainte Claire six-cylinder engine. Note the manner of driving the generator from the clutch gear shaft

through helical bevel gears from the clutch gear shaft. The clutch is a dry plate type with woven asbestos facing on the driven disk and differs only in detail from the unit used on the eight. The clutch pilot is a plain bearing and the throwout an annular ball.

Anti-friction bearings are used throughout the transmission. The clutch gear bearing is an annular ball type as is the bearing at the rear end of the countershaft. The speedometer drive is through helical gears from the hub of the universal joint companion flange.

Front and rear axles are the same as used on the eight. Hydraulic four-wheel external service brakes are regular equipment. The emergency brake is located at the rear of the transmission

and is operated by a hand lever located at the left of the driver just forward of the door.

Springs are semi-elliptic front and rear and the latter take the rear axle thrust and torque. Regular tire and wheel equipment consists of 33x6 balloon tires on steel disk wheels.

Standard finishes on the bodies are as follows: roadster, gray; Gray Goose Traveler, sage brush green; brougham, limousine blue; five-passenger sedan moleskin; seven-passenger sedan and limousine, brewster green light; seven-passenger phaeton, green gray. The hardware in the closed models has a hammered silver finish and the upholstery is broadcloth. The body frameworks are ash and the panels, aluminum.

Cadillac Coach Has Fisher-Built Body

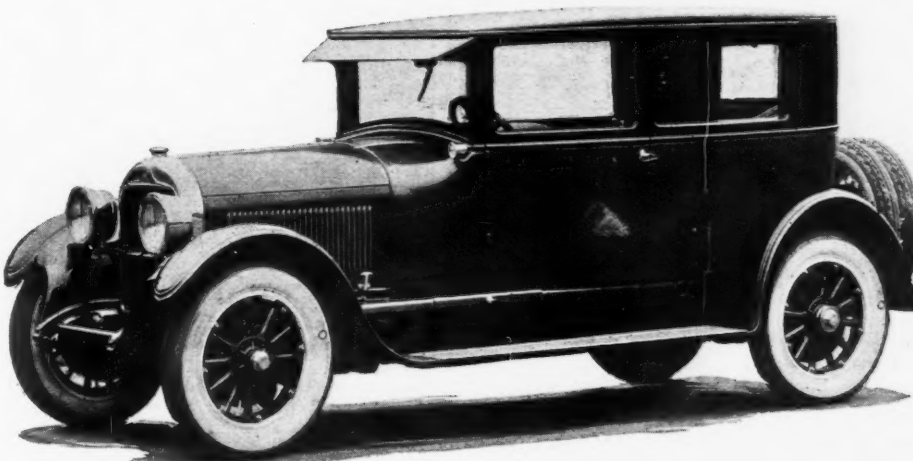
WITH the introduction of the Cadillac coach at the New York Show and simultaneously in dealer salesrooms throughout the country, all General Motors passenger car lines will include a Fisher-built body model of this type. The new model lists at \$3185 which is also the price of the Cadillac open models. Otherwise the line is continued without change except that the scroll embossed nickel radiator shell, which heretofore has been used only on the custom-built models, will be furnished on the standard line.

The new coach is mounted on the standard 132-in. wheelbase V-63 chassis. It is a two-door job with the conventional seating layout for five passengers. It is finished in green Duco with striping to match and is upholstered in taupe mohair plush. Marshall springs are used in the seat cushions. The width of the rear seat is 50½ in. providing ample room for three passengers.

Equipment on the coach consists of

rear view mirror, automatic windshield wiper, Fisher VV one piece windshield, dome light, sun visor, inside thumb lever lock on left door and outside lock on

right door, window regulators on door and quarter windows, curtains on rear and quarter windows, foot rest, trunk rack, and nicked lamps and hub caps.



The latest body style added to the Cadillac is the coach, shown above

The READERS' CLEARING HOUSE

Questions & Answers on Dealers' Problems

Tappets Should Be Set to Get Uniform Timing

Q.—Reading over an article on valve timing in the February 14th issue of *MOTOR AGE* I find a statement that valve tappet adjustment should be made use of to correct the time of opening or closing of the valves. It seems to me that if we increase the clearance to correct the time of opening or closing we at the same time decrease the amount of valve lift and shorten the time which the valve is open. How can such an adjustment produce any good results in engine operation? E. F. Phelps, 50 Bennett street, Bridgeport, Conn.

Increasing the tappet clearance does not necessarily mean that the amount of valve area is reduced. To put it in other words, while it may affect the height of opening and the period of opening, the amount of gas admitted to the cylinder is not decreased. The necessary requisite for maximum power and smooth running is that the cylinders receive a uniform amount of fuel, which means that each cylinder should have its valves open approximately the same number of degrees and that they should open and close at approximately the same time. This is especially true during the interval between the closing of the exhaust valve and the opening of the inlet valve. Engine characteristics are such that it is desirable to have a certain interval between the exhaust closing and inlet opening. With wear on the inlet or exhaust valve cam this point of opening and closing of the two valves will vary considerably and unless the parts that are worn are replaced the only method of compensating for it is to adjust the tappets. As the wear on the neutral part of the cam increases the lift of the valve will increase, if we maintain the same tappet clearance. When we do this however we throw the timing out to a degree depending on the amount of wear. By adjusting the tappets to conform to the recommended timing usually marked on the flywheel, we maintain as far as possible the original timing and in most cases do not decrease the lift to any noticeable extent.

STATUS OF THE KNIGHT ENGINE

any Knight motors in their cabs? If so, how many?

The Yellow Cab Company use a few Knight Motors in their cars used in Chicago. These engines, however, are not regular equipment on cabs sold to the consumer.

2.—What company uses Willys-Knight chassis for their cabs?

At the present time in Chicago there is no company using Willys-Knight chassis exclusively. Up until about a year ago the LaSalle Hotel Taxi Cab Company operated a fleet of cabs, using two makes of cars—Willys and Stearns-

Knight. This firm however has since been disorganized and the cabs have been sold.

3.—Did the Yellow Cab Company buy the R. & V. Engine Plants at Moline, Illinois. I have been told they did.

Yes.

4.—How many Knight-Motored cars are built in Europe and name them?

These cars have been named too often in *MOTOR AGE* and cannot be listed here except to say that Minerva, Voisin, Daimler, Peugeot, B. S. A. car and a few others, the names of which you will find if you will take time to go over the past issues of *MOTOR AGE*.

Assorted Essex Information

Q.—I have a 1920 Essex touring. The carburetor on this car is giving a lot of trouble. We have pulled the rich and lean adjustment completely out to the limit or it will not take the gas when you step on it, and loads when running idle. Give us what information you can on this.

Remove the carburetor and clean thoroughly. The carburetor valve should be cleaned and then polished with brass or nickel polish. While the metering pin is still out file a longer notch than the one that is in at the present time. It is necessary that a good surface be applied to the carburetor piston valve and to the air chamber into which it fits. A three cornered file will suffice to make a groove in the metering pin. The groove should face the engine.

2.—This car has a knock in the timing gear when idling down, but if you take hold of the generator coupling tight it stops. This new fibre gears in this motor but it is the same. Can we get an oversize cam gear for this motor or what is the best way to eliminate this back lash?

Oversize cam gears may be secured either from the Essex Company or from the manufacturers of the composition timing gears. If your gear is the type that makes use of the composition crank gear it will of course be necessary for you to secure the metal camshaft gear from the Essex Company.

3.—This same car has an awful time shifting into second without a lot of clashing gears. Can you give us some dope on this—Matson's Garage, 3218 Washington avenue, Racine, Wis.

The following information is taken from the Essex instruction book. When the clutch is fully engaged there should be about $\frac{3}{8}$ of an inch clearance between the pedal and the toe board. The pedal can be adjusted by means of the small screw and lock nut located on the stop on the clutch pedal shaft itself. Constant wear on the clutch plates will in time cause the pedal to stop farther away from the toe board than usual. When it does, it can be brought back to its original position by means of the above mentioned screw. If the clutch is worn or abused, due to lack of lubrication the corks may swell causing the pedal to come back nearer the toe board. The pedal should never come any closer to the board than $\frac{3}{8}$ in. or there will be danger of the clutch slipping when there is a load placed upon it. The clutch housing takes one-half pint of kerosene and lubricating oil, equal proportions. The old oil should be drawn out by removing the plug in the clutch housing. The clutch should be flushed with kerosene, drained and then filled with clutch oil of the proper proportions.

Motor Age Readers' Clearing House Index

For the Dec. 11, 18, and 25, 1924, issues.
For use of readers who keep a file of *MOTOR AGE* issues.

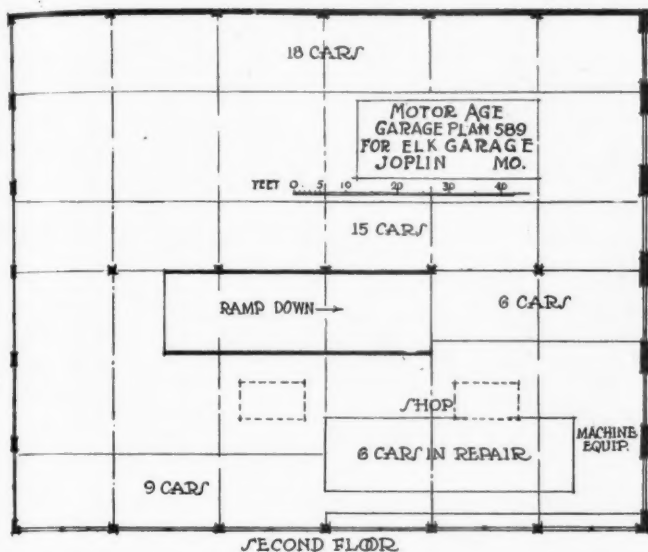
MEANING OF NUMERALS

"12-18-24 p25" means that the article is in the Dec. 18, 1924, issue of *MOTOR AGE* on page 25.

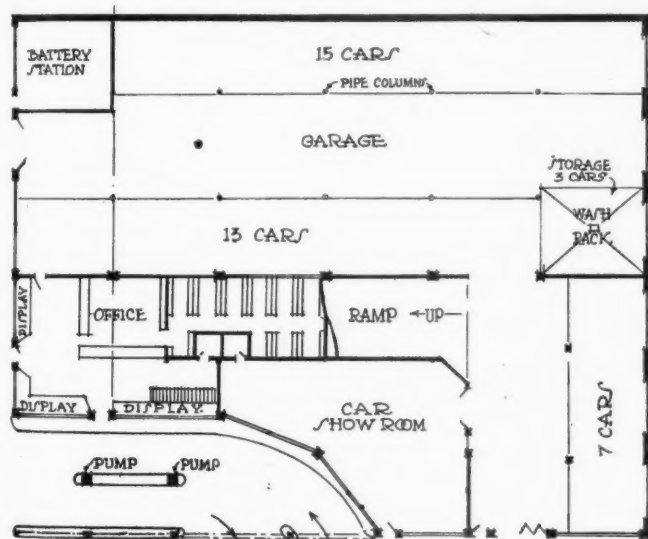
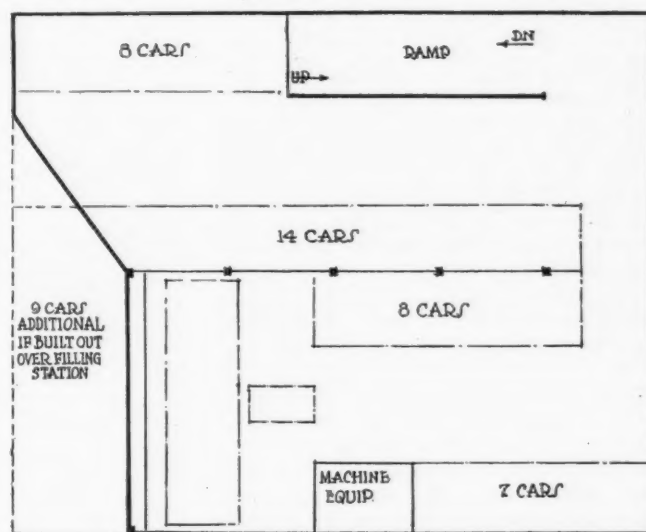
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The Readers' Clearing House

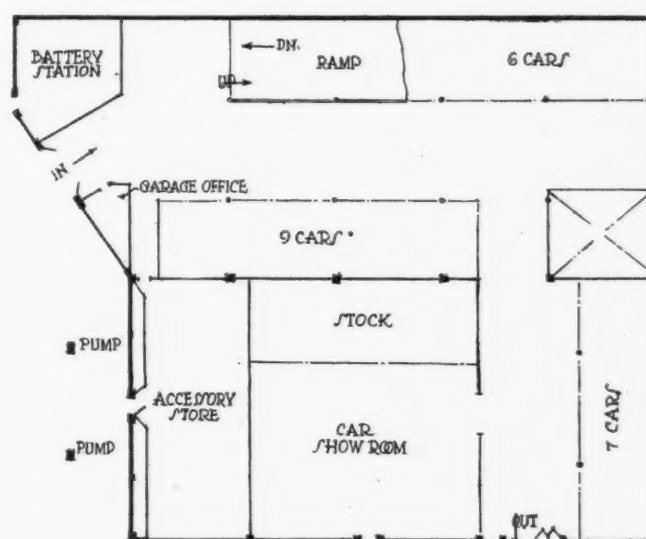
Two-Story Garage With First Floor Show Room



SECOND FLOOR



FIRST FLOOR PLAN A



PLAN B

Drawings show two plans for garage, either of which might answer purposes of Joplin Company requesting suggestions

Q. We will appreciate any advice you can give us relative to the erecting of a garage on a lot 125 ft. by 100 ft. The enclosed sketch will give you some idea as to the shape of the lot. We plan to have two floors, with a ramp leading to the second floor and on which floor we expect to have our shop. At present we employ three and four men in the shop. We are leaving our present location because of lack of room and at present have 35 live storage cars and about 10 dead storage—all we have room for. We would like to put our live storage cars on first floor, saving second floor for dead storage. The corner we have outlined on the sketch is

an ideal location for our filling station. We would like to include a room on first floor that we might rent out to some motor car agency as a show room. We also have quite a large stock of tires, and would want a good-size office and accessory room. There should be, it seems to us, an entrance in front, from the side street and the alleyway. This garage is located on one of the main highways into Joplin, through which town many tourists going into the Ozarks pass and often spend the night, a great percentage traveling over this highway. It might be a better idea to garage live storage cars, having delivery service on second floor.

Your suggestions relative to this would be appreciated.—Elk Garage, 410 Pearl street, Joplin, Mo.

We have made two layouts for your garage, one designated as plan A and the other as plan B. The principal difference between these two is in the location of the filling stations and the location of the ramps.

There are features in each that will recommend it and it will be a matter of weighing them against one another to de-

(Continued on page 52)

Architectural Service

IN giving architectural advice, MOTOR AGE aims to assist its readers in their problems of planning, building and equipping, maintenance stations, garages, dealers' establishments, shops, filling stations, and in fact, any building necessary to automotive activity.

When making request for assistance, please see that we have all the data necessary to an intelligent handling of the job. Among other things, we need such information as follows:

Rough pencil sketch showing size and shape of plot and its relation to streets and alleys.

What departments are to be operated and how large it is expected to be.

Number of cars on sales floor.

Number of cars it is expected to garage.

Number of men employed in repair shop.

How much of an accessory department is anticipated.

The Readers' Clearing House

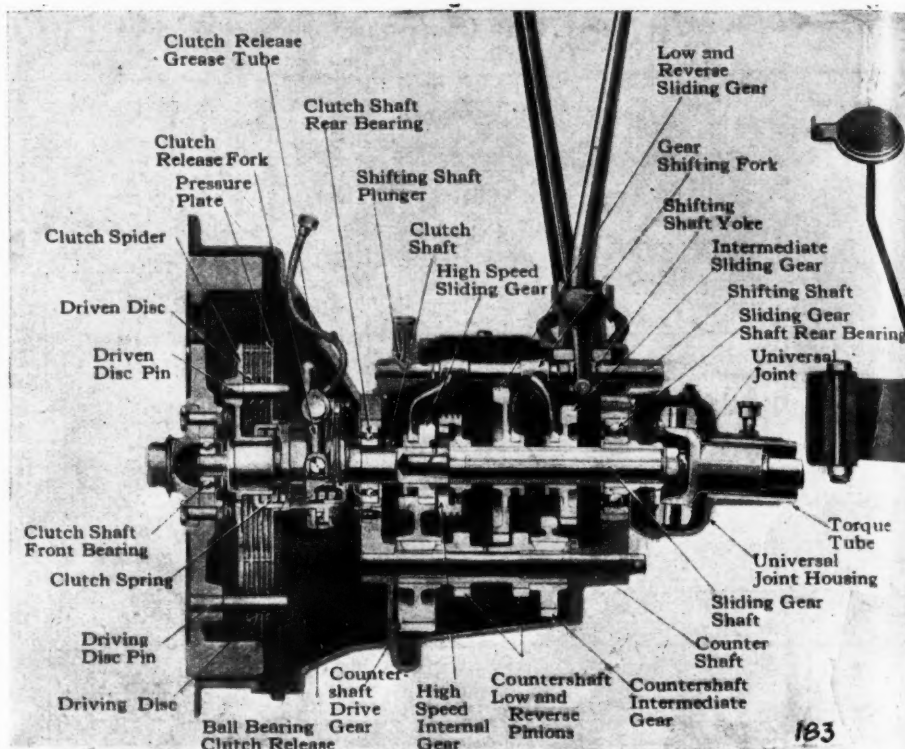
Roadster Has Grind in It

Q.—We have a 1923 Dodge Brothers roadster that has a grind in it when the clutch is engaged and motor idling. This car has new clutch-driven shaft and spider and clutch collar. Please advise where you think this trouble could be

A sectional view of the Dodge Brothers clutch and transmission used on the 1917 model, which is similar in most respects to the 1923 model, is illustrated at Fig. 183. We are of the opinion that the sound is caused from one of three probable sources. First, a worn high speed gear; second, a worn high speed counter shaft gear; third, a worn clutch ball bearing release. You speak of renewal of the clutch collar and we do not know whether you refer to the ball bearing or to the release collar only. The Dodge Brothers transmission differs from all other transmissions used in passenger cars in that the counter shaft is not in gear when the car is being driven on direct or high speed. However, when the car is stationary, the engine running and the gear lever in neutral the counter shaft rotates due to its connection with the end of the high speed gear at the tail shaft of the clutch. As the high speed driving gear is considerably smaller than the counter shaft gear it is more than probable that of the two it will wear quicker and cause noise. Ordinarily the clutch release ball bearings should not give any sound unless the clutch pedal has pressure against the bearings. The only condition under which this could exist would be the car standing still and the clutch engaged and the clutch pedal bearing against the floor board. Renewal of the clutch release collar will not stop noise due to a worn or under lubricated clutch release ball bearing. If the noise occurs only when the car is in neutral it must be in one of the three places mentioned and the most probable one being the transmission gear, previously mentioned.

2.—We have three E-45 Buicks that will not idle at all. Will hit fairly well at high speed, but has no pick-up or pep. Valves have been ground and new rings installed, but no results. Timing and carburetor O. K. Spits back through carburetor when accelerated suddenly. Advise as to the cause of this trouble.

One or more of several things could cause the trouble you speak of. We would suggest that you first test the car for compression in each cylinder. Inspect the setting of the spark plug points which should be not less than .020. Also check the condition of the interrupter camshaft which, if it has more than .005 diametral clearance in its bearing, will probably cause the trouble you speak of. In connection with this, test the interrupter point opening for each cylinder making sure that it is within .002 of being the same for each cylinder. Do not use spark plugs with extra long electrodes nor with more than one electrode. Test the tappet clearance both cold and hot. Repeated backfiring into the car-



Sectional view of Dodge Brothers clutch and transmission used on 1917 model

buretor will eventually destroy the carburetor auxiliary air valve spring which means that the air valve and spring assembly should be removed and the spring examined to find out its condition. If it shows signs of weakness replace it with a new one.

3.—Give the correct method to remove pistons for 1918 Hudson Super-six, also proper ring clearance.—Ben L. Hobbie, Box 134, Winfield, Texas.

In order to remove all six pistons from a Hudson super-six of the model mentioned it is necessary to remove the cylinder block as the counter weights on the crankshaft will not permit withdrawal from below and the connecting rod lower end bearings are too large to permit withdrawal from above. The recommended piston ring gap clearance is as follows: For regular concentric stock rings use .0065 to .007 of an inch clearance on the top ring, .005 on the second and .004 on the third.

Two-Story Garage With First Floor Show Room

(Continued from page 51)

termine which is preferable. If the side street is very narrow it may be impossible to use the filling station of plan B, though it will be seen at a glance that the show room and accessory store space is much better in this plan.

Plan A has somewhat greater storage space; this is partly due to the second floor being built out over the filling station and partly to the ramp cutting into the sales department instead of into the garage as it does in plan B. The ramp

in plan A is rather more convenient at the bottom but at the top the plan B ramp is slightly better. Both are two-way ramps.

Except for the filling station and ramps both buildings would be constructed in the same manner: a row of main columns through the center of the building extend up through the second floor and carry the abutting ends of two series of 50-ft. roof trusses while the smaller columns, spaced so as not to interfere with car storage, carry the portion of the second floor, not supported by the wall or the main central columns.

The repair shop should be on the second floor in either plan, where sufficient light is available through skylights for the best work. We have not put much detail in plan B but this could be worked out without material change if it should be thought preferable to plan A.

We agree with you in that it is best to take care of as much of the storage as possible on the main floor. After all this space is filled then it is well to take cars to the second floor.

PREPARING FOR EXHIBIT

GOLDSBORO, N. C., Dec. 29.—At an enthusiastic meeting of representatives of the Chamber of Commerce and local automobile dealers held here, it was decided to hold the sixth annual automobile show early in the spring, probably the first week in March. The show has become a fixture in eastern North Carolina. Many innovations will be seen at the 1925 show and plans are being made to make it the biggest and best exhibition yet held.

The Readers' Clearing House

Wiring a Dixie Magneto on National 12 for Easy Starting

Q.—We have followed your question department for some time and we are now coming to you for advice. We have a National series A. D. which is hard to start. It is equipped with a Dixie magneto and will not give enough spark to start at cranking speed unless the engine is warm. Priming makes no difference and the only way we can start is to tow the car fast enough to get the spark. Can you give us a wiring diagram which will enable us to use a battery in connection with the magneto for starting, or else change the magneto so as to use it as a distributor only and use a coil in connection with it. What kind of a coil would we have to have? We have tried a four-cylinder Remy coil but could not get over 15 miles per hour out of the car.—Dunn & Berry, Three Forks, Mont.

It is probable that the magneto needs to have its magnets charged and it is also possible that the inductor and the interrupter are not properly timed. If the magnets are either removed or else laid to one side after the sheet metal covers have been removed it will be possible to see whether the inductor is properly timed. The magneto should be timed by hand until the interrupter points are just ready to open. There should then be a gap between the inductor and the pole piece of from .030 to .040 in. Even with the magneto in good condition, you may find it advisable to install a system which is both effective and simple. The diagram is shown in accordance with your request. In the Dixie magneto you will probably find that one of the coil terminals has a small brass strap which makes a connection to ground or the iron framework of the magneto. This ground strap should be disconnected and discarded. Then a hole should be drilled through the cover plate

opposite this connection and an insulated bushing of some sort used. A flexible wire should then be used from the terminal which formerly had the ground strap on it and this wire should be run out through the insulated hole and connected to the starting motor side of the starting switch. Operation is then as follows: When the starting switch is operated, battery current flows to the starting motor and also flows through the primary winding of the magneto coil and through the interrupter to ground. The coil inside the magneto is then acting as a battery ignition coil and good sparks will be obtained at the plugs. There is some slight interference from the action of the magnets, but it is not sufficient to prevent getting a good spark. Then when the starting switch is released and the starting motor stops, the starting motor itself acts as a ground connection for the primary winding of the magneto coil and the magneto continues to function in the regular way. The grounding switch is used as formerly in order to stop the engine, by shorting out the interrupter.

INTERESTED IN SMALL PLANES

Q. I saw a photo of Clarence Chamberlain and his 58-pound 21-h.p. Douglas airplane motor. If you can do so, please send me all the information about his plane, motor and himself that you can. At least send me his address so that I can communicate with him. — George M. Andriik, 5908 W. 22d street, Cicero, Ill.

We regret to state that we do not have a record of Mr. Chamberlain's address and would suggest that you communicate with the Pacific and Atlantic Photos, Inc., 25 Park Place, New York city. This firm will be able, probably, to give you the address of Mr. Chamberlain.

The Douglas airplane engine illustrated is a product of the Douglas Motors, Ltd., Hanham Road, Kingswood, Bristol, Great Britain.

The Lamps Burn Out

Q.—We have a Chevrolet that is keeping us awake nights, trying to solve the mystery, and would like your help.

It is a 1924 model, run about 5,000 miles, with regular equipment, but have exchanged the battery and now have an Exide. The trouble is that we can't keep bulbs in it. They burn out one after the other or both at once sometimes. Have inspected the switch, wiring and cut-out, and everything seems O. K. The change of batteries did no good. The readings for this battery are about normal. I have not taken the generator apart yet. It charges pretty strong, "18 amp," but thought it should be all right while it is so cold. The owner states he has burned out some \$15 worth of bulbs so far and has had it to the dealer and others with no satisfaction.

Hoping you can give us some pointers as to where to look for trouble, we remain.—South Dakota Subscriber.

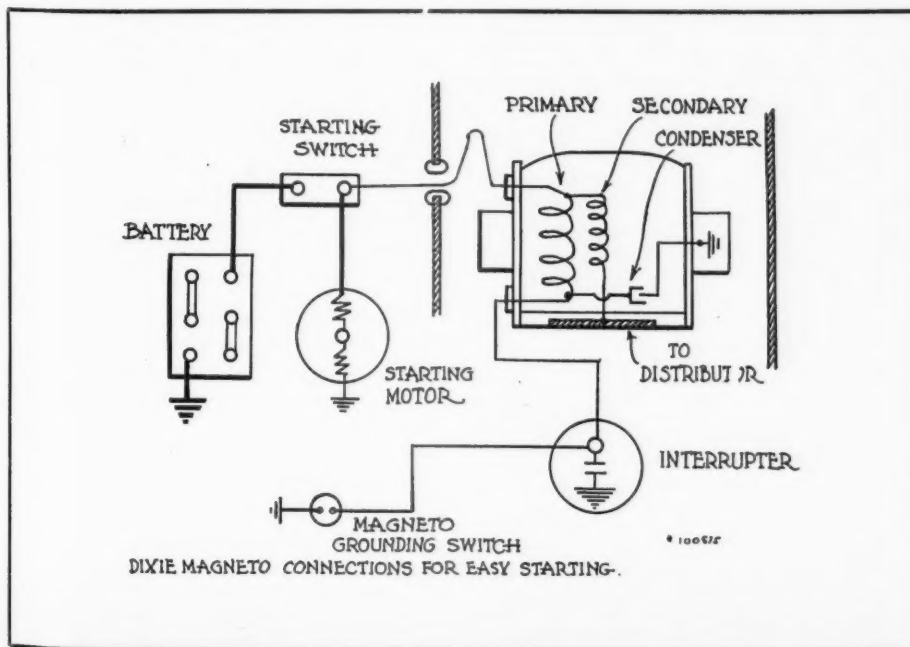
The trouble is due to a poor connection between the generator and the battery and about the only way to locate this is by using a voltmeter while the engine is running and the generator delivering current.

You should refer to page 48 of the January 17, 1924 issue of MOTOR AGE, as this gives a wiring diagram of the car in question. While the engine is running, take the battery voltage also the voltage from the generator terminal to ground. If the battery voltage is 7, the generator voltage should not be more than 7.5. If, for example, the generator voltage should be 2 or 3 volts more than the battery voltage, it shows that there is a poor connection which offers a high resistance to the flow of current and this rise in voltage will cause the lamps to burn out. The most likely source of trouble is a poor ground where the battery cable is connected with the frame of the car. Corrosion at the battery terminal posts may also cause trouble and occasionally a battery with a defective cell is encountered. Such a condition could be detected by taking voltage across each battery cell and if one is noticeably higher than the others, it might indicate internal trouble. In this case, the whole battery voltage would also be abnormally high. A poor connection inside the ammeter would also account for this condition and could be detected by means of the voltmeter which would show a considerable difference in reading when connected from the frame of the car to first one ammeter terminal and then the other.

ABOUT A CERTAIN PACKARD

Q.—What is the year of the Packard straight eight, whose motor number is 206046.—J. Weber, 595 W. 207th street, New York City, N. Y.

According to records in this office the Packard car in question was built in the year of 1923.



The Readers' Clearing House

Poor Fuel May Explain Low Gasoline Mileage

Q.—We have a 1923 model 490 Chevrolet that at first gave 17 miles per gallon of gasoline. The mileage then gradually went down to about 14. The Zenith carburetor was then removed and a Holly carburetor installed, but with no improvement.

The motor was then checked up and the valves ground and the carbon cleaned out. A Marvel carburetor was then installed and for the last 500 miles the car has been doing about 15 miles per gallon. The car has run about 5,500 miles now and seems to be all right except for the low mileage. Would the spark cause this condition if it was too much retarded? Since installing the Marvel carburetor there does not seem to be room enough for the spark lever to go down its full distance.

—W. S. Johnson, Maryville, Tenn.

A number of conditions are essential in getting good mileage from an engine. One of these is to have the car roll freely. It is also desirable to have the tires properly inflated. It is possible that the first reduction in mileage took place due to a change in the fuel being obtained.

If the gasoline is heavier than formerly an improvement in the operation of the engine would be noticed if a hot spot manifold is installed.

The spark advance should be sufficient so that you can move the lever far enough to either have the engine knock or feel that the car speed is being reduced. This would show that you have sufficient spark advance and that retarding the lever somewhat would give the most efficient point for normal operation. It might be well to consult with the nearest authorized service station with regard to this condition.

HAS A GRAY ENGINE

Q. Will you kindly tell me what motor is used in a 1918 model two-ton Traffic truck.—Bruce Barton, 940 S. First street, San Jose, Cal.

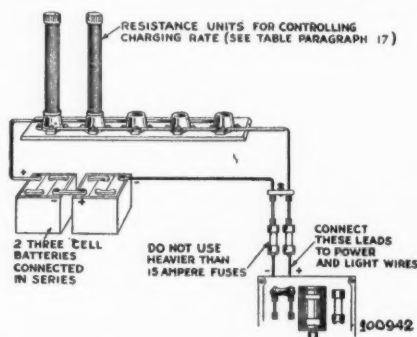
The truck in question carries a Gray engine of 3½-inch bore by 5-inch stroke. It is manufactured by the Gray Motor Corporation, Detroit, Mich.

CHARGING FORM A LIGHTING PLANT BATTERY

Q.—Send instructions for charging a 6-volt battery from a 32-volt farm light plant using carbon lamps for resistance, stating number of lamps needed.—North Carolina Subscriber.

We are showing an illustration which gives the circuits you require. In this illustration resistance units are used instead of carbon lamps, but you could use carbon lamps instead. There is also shown connection to a switch board, but you could connect directly to the positive and negative terminals at the end of your 32-volt battery. Instead of two batteries you could have anywhere from one to five. If one battery is used the negative end is connected to negative battery and the positive terminal is connected through the lamps to positive terminal. In connecting the string of batteries, con-

nection is made from plus to minus, plus to minus, etc., until all the batteries are connected. It takes just as much electrical energy to charge one battery as it does five, using this scheme, for the



Charging batteries from a 32-volt lighting plant with resistance units

electrical energy not used is wasted in operating the lamps or the resistance units. To tell how much current is going to the battery being charged you can

Cells to be Charged														
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Resistance Unit to be Used														
1	1	1	2	2	2	3	3	3	4	4	4	4	4	4
Approximate Charging Rate—Engine Running														
5.25	5.5	5	8.5	7.5	7	9.5	8.5	7.5	8.5	7.5	6.25	5	4	3
Approximate Charging Rate from Delco-Light Battery														
4.5	4.25	4	7	6.5	6	8	7	6	7	5.5	4.5	3	2	1

Table showing charging current obtained with Delco light resistance units and various numbers of cells

open one of the wires, for example, by disconnecting the wire at the negative battery terminal and connect in the circuit an ammeter such as a Ford meter. Then you can put in one lamp at a time until the proper charging rate is obtained. 32-volt lamps would be better than 110-volt lamps, for fewer of them will be needed. If five sockets are not enough you can add as many sockets as you need in parallel until the charging current is sufficient. If the 32-volt battery is not fully charged it would be well to operate the generator for a while so that the large battery will not be badly discharged. A table is also shown which indicates the approximate current which will flow, in the event that resistance units are employed. These resistance units can be obtained from some of the authorized lighting plant dealers, these being evidently more suitable for this purpose, as fewer units are required to do the same work.

TURN TO PAGE 50

for an index to the contents of the December numbers of MOTOR AGE. This will enable readers readily to locate any desired article which has appeared in the Clearing House Section of MOTOR AGE during December

Some Good Tips on Fordson Ignition

Q.—I have just read in Motor AGE of the trouble Wall Bros. Auto Co., Hampton, Neb., has had with a Fordson tractor. I am also looking for some advice, since I have the same trouble with an old Fordson.

The engine was overhauled and the coils spaced one thirty-second. The first day's run burned up two sets of coil units. These were bought from two different dealers, each claiming that the tractor unit was the same as the other units now. To finish the day's run an old set of coils from a 1915 car was used. These worked fine. I metered the current and the coil showed from 2 to 2½ amperes and 12 volts. I noticed that before the coils quit working that the points would stick, and if jarred loose would work again for a few minutes.

I have had several tractor men look at this machine and they could offer no suggestions.—M. E. Kimsey, Scottsdale Service Co., Scottsdale, Arizona.

About a year ago, the Ford Motor Co. had two coils, one with the word "Ford" written on it and one with the word "Fordson." The Fordson coil was the same as the other except that the condenser was larger in capacity, and on some of the Fordson coils the contacts were about 5/16 in. in diameter instead of 3/16 in. For about a year, however, the Ford coils have been made suitable for use on either the Ford car or the Fordson tractor, so that the dealers above referred to were correct in their statements.

We are advised by service representatives of the local Ford branch in Chicago that trouble with burning of the coil contacts is very rarely encountered. In certain districts where this trouble is experienced, it is sometimes attributed to alkali or other substance in the soil which is carried as dust in the air over the field where the tractor is working.

This dust, apparently, has a very detrimental effect on the contacts.

A suggested remedy is to use heavy brown paper as a sort of gasket or liner for the cover of the coil box so that the coil box will be very nearly air-tight, at least as far as the cover is concerned.

Other information we have received is to the effect that the Fordson tractor is sometimes run at excessively high speeds. This would mean that the magneto would be continuously generating a very high voltage, and it might be that a resistance of iron wire connected between the magneto terminal and the wire normally attached to that terminal would, to some extent, neutralize the effect of the high voltage.

ROAD TREAD OF ESSEX SIX

Q.—Will you please tell us the tread of the new Essex six. We have heard conflicting statements and would like to be correctly informed.—Holt Motor Company, Watertown, S. D.

The tread measured in front is 53¼ in. The tread at the rear is 55 in.

EDITORIAL

Order With Care

THERE is waste in all industry—too much waste. One cause is the carelessness with which both consumers and dealers make purchases. In the automotive industry the jobbers in the A. E. A. find that their losses from returns and exchanges of merchandise amount to so large a figure that the association's merchandising department intends to conduct an active campaign to try to reduce this item. It is found that a great deal of the loss from exchanges comes from inexact ordering. The dealer ordering parts is not careful to specify exactly the size, models, shape or other specifications required for the wholesaler or manufacturer to positively identify the article.

It is also true that many dealers buying merchandise for resale do not accurately gage their markets and seek the privilege of returning goods for which they have no sale. In other cases lack of care in ordering results in the dealer obtaining goods that are not what he thought he was buying although exactly what he ordered. To reduce this waste from returns and exchanges of merchandise is to promote a business economy that will be of advantage to the whole industry and to the consumer. It is the dealer's duty to take an active interest in eliminating all the waste that he can from his business.

Aggressive Defense Needed

THE automotive industry is now the subject of a nibbling attack which, if it continues to be successful, will result in severe curtailment of the practical utility of the motor vehicle to the American people. The attack is principally by way of gradual imposition of heavier and more numerous taxes.

In California when a gasoline tax was imposed the registration fee was reduced to a nominal sum, the fuel tax being relied upon to produce the revenue required for road maintenance. The fuel tax worked wonderfully well and produced a vast amount of revenue, but not enough to build all the roads the state wanted. So now it is proposed to increase the gasoline tax and at the same time increase the registration fee. It is easy to get revenue out of the automobile, for if the owner does not pay he may find himself unable to use his vehicle, and the motor vehicle is a tremendously useful article.

The situation in California is not unique. In other states the nibbling attack on the automobile is under way. Legislators everywhere want more money to appropriate and the automobile seems to provide the most accessible means of procuring it. The present tendency is largely toward a tax or higher tax on gasoline.

The automotive industry collectively and the automobile owner individually have never objected to paying a reasonable assessment for the privilege of motor transpor-

tation so long as the revenue went to the maintenance of highways. But the imposition of taxes cannot continue indefinitely. There is a reasonable point at which to stop and it appears that in most states this point has been reached, if not already passed. The automotive industry may as well prepare for aggressive defense, for that is the only way these tax raids on motor transportation can be stopped.

A Good Show Plan

THE ideal plan in staging a community automobile show is to house all exhibits under one roof. After this comes the plan of holding the show in the different salesrooms of those participating, each dealer attending to his own decorations and all dealers joining in group advertising.

This latter arrangement is always an excellent resort when it is found impractical to hold the demonstration in one great auditorium, and it is becoming steadily more popular. Where dealers are unorganized it offers one practical way of calling the public's attention to automobiles in a manner much more forceful than that found in ordinary independent competition.

It would be well if community dealers who, for various reasons, find it difficult to stage shows under one roof, would make yet more liberal use of this idea. The public will always take greater interest in something "special" than in those things that appeal to it as belonging to the everyday routine. The big idea is that it takes the prospect on an inspection tour, thus promoting his interest in an article that the trade is trying to sell. Before they can be expected to buy cars people must look them over and make comparisons. The more they meditate on the subject the better it is for the trade.

Make a Working Schedule

THE new year calls for planning. The automobile manufacturer has had to look ahead and hazard an estimate as to the number of cars he will be able to produce and sell this year. He has asked his dealers and distributors to say how many they can sell. In this way he is able to operate most economically and keep prices at a reasonable level. The dealer also should plan his year's work and, knowing that he is expected to sell a given number of cars in the year, should see that he has a schedule and lives up to it from the beginning. If the objective is a given volume of profit for the year the dealer must begin at once to realize that profit. Deferred profit is not tangible and doesn't show in the bank account. Don't expect to realize this month's profit next month. Do it now and have a working schedule that you can live up to.

1924 Second Best Production Year

Last Twelve Months Period of High Factory Operations

Caution Will Continue to Be Governing Factor in Direction of Car Manufacturing

NEW YORK, Dec. 29.—Reports from a number of automobile-producing plants show production the first half of December running 10 per cent ahead of the corresponding period in November. The slowing up in operations the latter part of the month, due to closing of plants during the holiday season, will offset this gain and bring down the total output for the month.

Production of cars and trucks for 1924 is estimated at 3,650,000, of which 3,280,000 are passenger cars. This compares with 4,086,997 in 1923, with car production placed at 3,694,237, and makes 1924 the second best in the production history of the automotive industry.

The year has been one of high operations, based on the average monthly output, although the record established in 1923 was not reached. Conditions throughout 1923 were exceptional and warranted the maintenance of unprecedented schedules through the greater part of the twelve months. Some unforeseen factors retarded buying in 1924 and the presidential campaign produced a certain hesitancy on the part of the buyers.

With manufacturers governing their production by retail demand, the closing of the year finds the manufacturing branch of the industry with low inventories and the selling branch with practically no finished products on hand. This will be reflected in the resumption of high schedules by both car and parts makers with the turn of the year.

Caution, however, will continue to be the governing factor in operations, with plants operating only to the extent that actual orders or well-based prospects for future sales justify. Parts makers increased their schedules somewhat during December in view of larger commitments placed by car manufacturers. January will see a more notable advance in parts-making programs and most of the plants, it is now expected, will be operating at capacity.

Check Up on Buying Mood

Concrete evidence of the buying mood of the consumer will be given at the New York show, which opens to the public on Jan. 3. Early indications are that there will be a considerable placing of orders by dealers due to the low condition of their stocks and the bright outlook for early-year sales to retail buyers.

Sales conditions throughout the country varied widely during December, some cities reporting an increase over November. Local conditions as a rule are re-

ported to be excellent for an immediate resumption of purchasing after the new year opens. Employment is good and the outlook for former buying is distinctly encouraging.

Foreign markets are expected to absorb a larger part of the output of American plants next year than ever before.

Cleveland Company Offering Coach Premier Priced at \$1295

CLEVELAND, Dec. 29.—A coach premier has been added to the Cleveland line. It sells for \$1,295, said to be the lowest price of any closed Cleveland car ever brought out. The body is by Fisher and is finished in Bloomfield gray and black, Duco finish. All contours are achieved by pleasing curves instead of angular corners. The doors are 35 inches wide, affording easy passage to and from the rear compartment. The rear seat is unusually wide and there is good leg room. The windshield is the Fisher VV and the upholstery is taupe gray worsted. The hardware is in matte silver. The equipment includes the automatic dash-controlled windshield wiper that is part of the VV windshield, leather-covered sun visor, cowl lamps, dome lamp and full-width foot rail.

GIVE CHRISTMAS PARTY

SPRINGFIELD, Mass., Dec. 27.—Rolls-Royce of America, Inc., gave a Christmas party to more than 1,000, including employees and members of their families, at its East Springfield plant. The celebration was modeled after that which has been held for years at the parent plant in Derby, England. Gifts were distributed to 400 children. Greetings were sent to F. Henry Royce, originator and designer of the Rolls-Royce car, and other plant officials in Derby, and to L. J. Belnap, president of the American company, in Montreal.

Novel Staging of Automobile Show Is Planned at Toledo

Garage Space on Three Floors of New Building to Be Used for Exhibition

TOLEDO, Dec. 29.—Toledo's annual automobile show to be held Feb. 2 to Feb. 7 under the auspices of the Toledo Automotive Trades Association will be unique. It will occupy three floors of the new Richardson building now being completed at Jefferson avenue and St. Clair street, in the heart of the business section and on the principal theater street here.

This new building is four stories high and is 225 by 120 feet. The top floor is to be the new home of the Toledo Chamber of Commerce, with large auditorium and dining room.

Each of the other floors has a row of offices on the outside of the street—stores on the ground floor—with the inner portion given over to garage space reached from the ground floor by ramps.

The automobile show will be the first event to be held in the new structure. At that time the formal opening of the building will take place and the public will have its first chance to see it along with the show.

Drawing for spaces in the show will be held in the near future and active preparations will start for making it the biggest show Toledo has ever had.

Dealers are quite optimistic over the outlook for the next few months.

DEALERS INCORPORATE

BECKLEY, West Va., Dec. 29.—The Hudson-Essex Co. is the name of a new firm recently organized and incorporated at Beckley, with \$25,000 capital, to distribute the Hudson and Essex line in the territory adjacent to the city. Incorporators named are W. C. Agee, C. R. Farnsworth and French Lucas.

Pennsylvania Plan Urged as Means of Curbing Fraudulent Service Associations

NEW YORK, Dec. 29.—Legislation to curb the growth of fraudulent automobile service associations, similar to that being undertaken in Pennsylvania, is advocated in a bulletin issued by the National Vigilance Committee of the Associated Advertising Clubs of the World.

Pennsylvania, the announcement says, has enacted a law giving the insurance commissioner supervision and control and authority to examine automobile protective or co-operative companies. "It is further worthy of note," it adds, "that the Better Business Bureau of the District of Columbia has but recently obtained the issuance of a warrant charging a representative of the Capitol Automobile Owners Association with obtaining money under false pretenses. The policies, it is charged, were at variance with the representations made by high-pressure salesmen and a score or more complaints resulted."

Seek Standards for Piston Rings, Brake Linings and Plugs

Representatives of Industry and Simplified Practices Division Take Preliminary Steps in Movement

WASHINGTON, Dec. 29.—The preliminary step for standardization in the automobile industry of its use of spark plugs, brake linings and piston rings was taken up here when representatives from the industry met with the Division of Simplified Practice of the Department of Commerce.

There was practical unanimity of opinion that standardization and simplification in these three items is not only possible, but greatly needed. It was decided that the Society of Automotive Engineers should be authorized to make a thorough study of the possibilities of standardization of brake linings, spark plugs and piston rings and that a meeting would be called later, when the findings of the society could be taken up for action by the manufacturers.

Discussion brought out that there are two phases entering into simplification of these commodities, one being the demand for new car construction, which was declared to be relatively simple; and the other being the demand for service and replacements on cars. The first phase of this simplification, it was declared, can be solved only by the action of automotive engineers and designers, while the second must take recognition of the number of "orphan" or obsolete cars now on the market, the changing trend of motor design, the growth of truck and bus transportation and the effect of wear and tear.

Many Sizes Found

That the conference might have something specific to work on a report on the brake lining simplification problem was made by R. S. Burnett of the Society of Automotive Engineers and F. C. Stanley of the Asbestos Brake Lining Association. It disclosed that there are now manufactured more than 100 sizes, as to width and thickness, of brake linings. Opinion was expressed that 28 sizes would meet the demand. Figures submitted showed that last year a total of 51,000,000 feet of brake lining was sold, of which 7,800,000 feet was manufactured and sold for miscellaneous combinations, while of 24 sizes 60 per cent of the sales were in five combinations of width and thickness.

Because of this multiplicity of sizes in width and thickness it was pointed out that it is now virtually impossible for jobbers and dealers to stock a full line from any one house, let alone the entire field of manufacturers' line, and that the financial burden of stocking even fair partial lines of two or three companies is too great and not profitable for the dealer or supply man.

Problems of the spark plug manufacturers were divided, as in the case of the brake lining group, into new construction and replacements.

Here, however, a further complexity was added to the development of aviation, motorcycles, motor busses and racing types of automobiles; as well as the changing design of motors and the need of providing for air-cooled and water-cooled motors by different types of spark plugs. It was voted by the conference to refer to the S. A. E. the question of developing standards for the clearance space for spark plugs as well as terminal connections. A committee will be appointed by the society to take up with engine designers and manufacturers the necessity for changes which will be of advantage to user as well as the parts industry.

On the question of piston ring standardization it was developed that there are now 4,800 sizes and that 100 sizes and varieties would cover all necessary needs for new car construction. This phase of the simplification program will also be worked out by the S. A. E. for future ratification by the conference. In connection with the piston ring simplification phase it was also voted to consider standards for pistons, piston bushings, wrist pins, and wristpin set screws.

Gotham Store Parks Cars for Patrons

NEW YORK, Dec. 29.—The no-parking traffic rules have made it so inconvenient for shoppers to use their automobiles in the congested part of the city that a large Fifth Avenue store, Franklin Simon & Co. has established a "Parking Garage" for customers. Where customers drive their own cars, uniformed chauffeurs are provided to take the cars to the garage and return them to the store. Where the cars are chauffeur driven, the chauffeur takes the car over himself and recreation rooms are provided. A feature of the service is that the cars are fully insured against fire, theft, personal liability and property damage from the instant the owner steps out until he or she steps in again.

Moskovics Is Given \$158,883 Verdict Against Franklin Co.

Court Fixes Date When Defendants Can File Motion to Set Aside Award of Jury

UTICA, N. Y., Dec. 26.—Fred E. Moskovics, who resigned last summer as vice-president in charge of sales for the Franklin Automobile Co., Syracuse, N. Y., due to differences with H. H. Franklin, president, regarding sales policies, has been awarded a verdict of \$158,883 by a jury in the Federal court for the northern district of New York state for alleged breach of contract by the Franklin company and for damages for the five-year life of the contract.

The verdict of the jury was that the contract had been breached by the company. Mr. Moskovics had sued for \$397,863, a sum computed on salary and commission for the five-year contract period.

The court fixed Dec. 27 as the date on which the Franklin company can file a motion for setting aside the verdict on the grounds of excessive damages. The amount awarded is said to be the largest awarded by a jury in a similar case in this district of the Federal court.

The difference of opinion with regard to the sales policies between Mr. Franklin and Mr. Moskovics related to the announcement of the new model Franklin, made to Franklin dealers last June, when the alleged breach of contract took place.

Ford's Domestic Production About 100,000 Less Than 1923

DETROIT, Dec. 29.—Ford Motor Co.'s domestic production for 1924 will run approximately 1,810,000, or about 100,000 less than last year. Up to Dec. 1 the total was 1,706,432. December production is considerably reduced owing to the Christmas closing but will approximate the 100,000 mark.

The above figures include cars and trucks made in the United States. With the export totals this figure will be augmented considerably. It is almost certain to pass the 2,000,000 mark, in view of the increase in business in most foreign countries during the year.

Inroads of Automobiles on Horse Vehicles Shown in Census Bureau Survey

WASHINGTON, Dec. 29.—Inroads being made by the automobile on the horse-drawn vehicle are graphically shown in a census of the latter industry, just completed by the U. S. Census Bureau.

Comparative figures for 1923 are made with 1921 and show that the number of establishments manufacturing horse-drawn vehicles in 1921 was 967, compared with 493 in 1923, a decrease of 49 per cent during the two years. The value of the manufacturers' product decreased from \$42,445,968 in 1921 to \$41,994,173 in 1923, a loss of 1.1 per cent during the two-year period.

A comparison of the horse-drawn vehicle manufacturing industry with that of the automobile industry shows that out of a total output of vehicles in the United States in 1923 there were manufactured 3,890,134 motor vehicles, valued at \$2,611,447,430, compared with 236,091 horse-drawn vehicles, valued at \$41,994,173.

Stutz to Display Two New Body Styles at N. Y. Show

Four Passenger Coupe and Five Passenger Sedan, Both Sixes, Are Priced at \$3580

INDIANAPOLIS, Dec. 29.—Stutz Motor Car Co., which will show two new body styles at the New York Show, a four-passenger coupe and a five-passenger sedan, will exhibit sixes exclusively. The new types present a four-passenger coupe and a sedan in which the new Speedway six motor is mounted.

These new body styles are priced at \$3,580.

All Stutz prices are now delivery prices. Extras for government tax and for freight from factory have been eliminated from list prices for all territories east of the Rockies at least.

Flat Pacific coast prices will also be announced later. This flat price policy with the advertised list price as the delivery price for all parts of the country, with the noted exception, is one of the important innovations of the Stutz show and 1925 plans. Another novel feature of the Stutz exhibits will be the display of two cars finished in the new patented Robbins polychrome process which give a subdued mottled effect in harmonious color tones. Stutz is the only company which will show cars in this style of finish.

Christmas Campaign Produces Increase in Month's Business

LOUISVILLE, Ky., Dec. 29.—The Christmas Advertising Campaign of the Louisville Automobile dealers resulted in a considerable increase of sales over November. This applied, to some extent, to used car sales. However, the volume of business was about the same as December, 1923.

In January automobile sales in the city are expected to slow up somewhat on top of a brisk December. In the state, predictions are that trade will be good because of the distribution of several million dollars to Burley tobacco growers.

Time payment plans announced in connection with the Christmas drive were taken advantage of by prospects and in many instances, the Christmas Club savings check was sufficient to meet the first payment.

TO INCREASE SCHEDULE

MILWAUKEE, Dec. 29.—The Milwaukee assembling plant of Ford, which has been running on a 4-day-a-week schedule, goes to 5 days on Jan. 1, and on Feb. 1 full time will be resumed, according to Harry M. Buckley, manager. The capacity is being increased about 25 per cent by the installation of a new type of electric oven and a new conveyor system, which will dry paint on wheels artificially in a half hour, the process now requiring 24 hours.

Vienna's Registration in Big Slump

WASHINGTON, Dec. 27.—Economic conditions, coupled with overtaxation by city authorities, has reduced the automobile total of Vienna, Austria, to exceptionally low proportions. With a population of more than 2,000,000 the registration of automobiles at the present time is only 3,200 private automobiles, according to figures compiled recently by city authorities, or about 1,200 less than last year.

The automotive division of the Department of Commerce is informed that this reduction is attributed solely to the economic crisis which has reached virtually all branches of business.

Court Sets Dec. 31 to Hear Petition for Duesenberg Sale

INDIANAPOLIS, Dec. 29.—The probate court here has set Dec. 31 as the date to hear the petition filed by Receiver William Rassmussen that the Duesenberg Motors and Automobile Co. and assets be sold. It is understood that at least two reorganization plans and bids will be considered and that officials of the court and of the company expect that the sale will be to one of the reorganization groups which will carry on the manufacture and sale of the Duesenberg.

Present indications are that the hearing of the petition will bring out active bidding for the company, which seems to have made real progress under the year of receivership.

The entire merchandise creditor liabilities are said to be about a quarter of a million dollars. One important group of stockholders, co-operating with Fred Duesenberg, is said to have made heavy pledges for bidding in the company and carrying on the company after the court sale. Details of this plan cannot be learned now.

HAYNES TO EXHIBIT

KOKOMO, Ind., Dec. 29.—Developments in the affairs of the Haynes Automobile Co. have made it possible to arrange for the exhibition of Haynes cars in the New York show, although only recently it was announced that for the first time since the first motor vehicle shows there would be no Haynes exhibit.

Among the reasons for the decision to send Haynes cars to the show is that a sound reorganization is believed in sight and, with this in view, members of the bondholders' committee believe that an exhibit in the show would be of great importance. This will be the twenty-fifth consecutive time that the company, now in receivership, has participated in the show.

Complete Program for Foreign Trade Convention on Jan. 6

Invitations Sent to Nearly 1,500 Executives and Sales Officials to Attend Gathering

NEW YORK, Dec. 29.—Announcement has been made of the completed program for the foreign trade meeting to be held at the Armory, in connection with the automobile show, on Tuesday, Jan. 6, which has been designated as Export Trade Day. This meeting, under the co-operative direction of the Motor & Accessory Manufacturers Association, the Overseas Club of the Automotive Boosters International and The American Automobile (Overseas Edition) and El Automovil Americano, will commence at 2 o'clock. The program follows:

Chairman, H. L. Kraus, President, Overseas Club.

How the Car Exporters Have Paved the Way for Accessory Sales—James D. Mooney, Vice-President, General Motors Corp., and President, General Motors Export Co. and Overseas Motor Service Corp.

The Automotive Picture Abroad (Illustrated)—George E. Quisenberry, Editor, The American Automobile (Overseas Edition) and El Automovil Americano.

How to Handle and Finance the Export Orders (Illustrated)—J. F. Kelly, Jr., Export Manager, Electric Storage Battery Co.

What Export Sales Have Meant to My Company—F. B. Caswell, Vice-President and Sales Manager, Champion Spark Plug Co.

The Field in Europe—Percy Owen, Chief, Automotive Division, Bureau of Foreign and Domestic Commerce.

Here and There Throughout the World—Short talks by visiting jobbers and distributors from Australia, Mexico and other sections.

Invitations to the meeting have been sent to nearly 1500 executives and sales officials of the various automotive companies and, despite the limited time in which the organizing committee has been at work, many acceptances have been received, evidencing the interest created, particularly in the accessory and equipment field, as to the development of sales campaigns abroad.

Plans are being made for the entertainment of visitors from abroad during show week. This will be under the direction of F. J. Werner, vice-president of the Overseas Club and president of the Shaler Export Co. of this city. Information concerning the meeting may be obtained either from the organizations co-operating or from The Export Trade Day Committee (Eleventh Floor), 239 West 39th street, here.

AMPLE EXHIBIT ROOM

ROCKFORD, ILL., Dec. 29.—Rockford's automobile show will be held Jan. 12-17 in the new Rockford Storage Warehouse Company, on North Madison street. At least a score of dealers will participate and the new location assures ample location for all. In the new headquarters, the show will not be restricted to members of the association, but space will be available to any dealer in the city. A. C. Price is chairman of the show committee.

Automobile Electric Service Association Meets Jan. 26-29

Sales and Service Among Subjects to
Be Discussed at Coming Gath-
ering in Chicago

CHICAGO, Dec. 29.—The fifth annual meeting of the Automotive Electric Service Association will be held in the Florentine Room of the Congress Hotel, Jan. 26 to 29. A cordial invitation to attend the meeting has been extended to all service station operators whether or not they are members of the association, and to all persons engaged in the servicing or distribution of storage batteries in the automotive industry.

A tentative program provides for a meeting of the board of governors of the organization the afternoon of Jan. 26 for the completion of convention arrangements. On this day a registration bureau will be opened at association headquarters.

Tuesday forenoon will be devoted to a business meeting and the afternoon session will be taken up with short sales talks by representatives of manufacturers of automotive electrical equipment. **Service Day**

Wednesday has been set aside as "Service" day during which the subject of "service" will be discussed by manufacturers' representatives. During the afternoon session of this day an address will be made by a speaker of national reputation. The brief "sales" and "service" talks during Tuesday afternoon's and Wednesday's sessions will be followed by a five minute period for discussion and questions.

The program also provides for the allotment of definite hours when equipment manufacturers will meet their central service representatives and distributors for the discussion of problems.

Arrangements are being made for reduced railroad fares from all points and several sections are making up special car parties.

AWARDED ROLLIN FRANCHISE

MILWAUKEE, Dec. 27.—The Rollin franchise in Wisconsin and Upper Michigan has been awarded to Brietzki, Pauli & Co., Racine, Wis., who have established a sales and service headquarters at 455-459 Broadway, in Milwaukee. The present quarters at 510-512 College avenue, Racine, will be retained. A. G. Roth has been appointed manager of the Milwaukee headquarters. Until now he handled Rollin sales in the R. D. Rockstead organization, Milwaukee, which has relinquished the franchise.

TO CHANGE NAME

DETROIT, Dec. 27.—The name of the Detroit Motor Valve Co. will be changed to the James Motor Valve Co., effective Jan. 1. The change in name is brought about by the desire of directors to connect more closely the name of the company with its trademarked product.

Rube Demonstrator Shows Car

PHILADELPHIA, Dec. 27.—J. H. Stafford, retail salesmanager of the Oakland Motorcar Co., Philadelphia, is using a novel method of attracting the public's attention to the features of the new Oakland cars. "Uncle Si," the "rube" Oakland demonstrator, has been given charge of the publicity campaign. With an Oakland 6-54 model Standard touring car, "Si" proves that, to all appearances, he is a relic of the days when the first horseless carriage rolled up Broad street. He contrives to impress the crowds of curious folks with the facts in regard to the Oakland performance.

Texas Woman Governor-Elect Confers With Motor Dealers

DALLAS, Texas, Dec. 27.—Automobile dealers of Texas are letting Mrs. Miriam A. Ferguson, governor elect of Texas, know they are opposed to any additional taxes on motor vehicles, gasoline, accessories, tires or anything which affects the automobile owners.

For the purpose of discussing coming legislation affecting roads and automobiles, where taxes would be involved, Mrs. Ferguson conferred with automobile dealers and others at Dallas. The proposal set forth by the Ferguson regime is to reduce the taxes on automobiles and increase the levies on gasoline to make up the difference. Another proposition is to distribute a greater portion of the taxes on motor vehicles among country schools.

Mrs. Ferguson has expressed no opinion as to what will be the result of the conference. Since she called the meeting at Dallas for the purpose of obtaining the views of the automobile dealers it is believed she will not recommend any additional taxes on motor vehicles in Texas.

SOUTHERLAND LEAVES CADILLAC

CHICAGO, Dec. 27.—Announcement has been made of the resignation of L. B. Southerland, as general manager of the Chicago branch of the Cadillac Motor Car Company. No announcement as to Mr. Southerland's plans has been made, but it is understood he will remain in the automobile merchandising field. Mr. Southerland has been with the Cadillac organization for more than 15 years. He is a member of the Board of Directors of the Chicago Automobile Trade Association and has been one of the most active figures in that organization. The Chicago post will be filled by H. M. Stephens, who has been serving as Eastern District sales manager, with headquarters at New York.

Packard Closed Models in Six Line Cut to Closed Car Level

Sweeping Reductions With Range
From \$640 to \$840 on Various
Units Announced

DETROIT, Mich., Dec. 30.—In one of the most striking price reductions the industry has known Packard Motor Car Co. this week brought the prices on the closed models in the six-cylinder line to the price level of the open models in this line. The reductions range from \$640 to \$840 and make a price scale of \$2,585 to \$2,885 where formerly the range was from \$2,585 on the open models to \$3,675 on the closed. The prices on the eight-cylinder line are not changed. The new prices on the complete six line are:

5-passenger sedan	\$2,585
7-passenger sedan	2,785
5-passenger limousine	2,785
7-passenger limousine	2,885
4-passenger coupe	2,585
5-passenger coupe	2,685
5-passenger touring	2,585
7-passenger touring	2,785
4-passenger roadster	2,785
4-passenger sport touring	2,750

The prices on the open models are as formerly.

In a statement accompanying the Packard announcement it was declared that the reduction had been made in the midst of one of the most prosperous years of the company's history with prospects ahead for a big year in the entire industry. No change will be made in the quality of material and the same standards of workmanship will be adhered to, the company says.

MERCER PRODUCING

TRENTON, N. J., Dec. 29.—Mercer Motor Car Co. is back into production, although on a limited scale. At present it is making four or five cars to exhibit at the New York and Philadelphia automobile shows. They are custom jobs with the buyers given the choice of color finish and upholstery. Some changes are being made in the line as formerly produced, and all models will be fully equipped.

Until the plant reopened in October it had not been producing for eight months. The new company, formed to take over the plant and now operating it, is headed by Frank Curran. The other officers are John L. Kuser, Jr., vice-president, and William E. T. McDevitt, secretary and treasurer.

MOVE RICKENBACKER AGENCY

MILWAUKEE, Wis., Dec. 27.—The Chidester-Frint Co., Milwaukee, recently appointed distributor of the Rickenbacker, has moved from 528-532 Broadway to new and larger quarters at 495-497 Broadway.

To Talk on Good and Bad Methods Used By Salesmen

**Address Before N. A. D. A. Dele-
by Burruss Promises Valuable Sug-
gestions on Merchandising Cars**

CHICAGO, Dec. 29.—Good and bad methods employed by automobile salesmen in merchandising automobiles will be discussed by W. B. Burruss, sales consultant of the National Automobile Dealers' Association, at the annual meeting of the association at Hotel La Salle, Chicago, Jan. 26-29. Mr. Burruss presentation has been developed from the study of selling methods in more than 50 cities of the United States and in more than 300 retail establishments.

In its program of increased service to the trade, the N. A. D. A. engaged Mr. Burruss last year as its sales consultant with a free hand to study selling methods in the business, to improve existing effective methods and remove unsound policies and practices as he found them.

For more than 25 years a salesman on the firing line selling numerous things throughout the United States, and having charge of effective sales organizations, Mr. Burruss brought to the automobile industry a wealth of experience that has proved of the utmost value in developing fundamental policies of automobile merchandising.

Value of Salesman's Time

Mr. Burruss had laid greatest stress upon efficiency in selling through the most profitable use of the salesman's time, and his own experience has proved conclusively to him, he says, that the time of thousands of business men is wasted by salesmen every year, causing losses of millions of dollars because the salesman has not perfected himself in presentation of his product or determined the scope of his market.

The problem of market analysis will be presented by Edward Payton of Cleveland, "Developing the Retail Sales Plan." "Applying the Sales Plan to the Prospect," will be discussed by Harry Collins Spillman of New York, merchandising director of the Remington Typewriter Co. Other subjects to be presented will be automobile financing, management, service and used cars.

DISCUSS COMPULSORY INSURANCE

NEW YORK, Dec. 27.—With a view to adopting a general attitude toward compulsory automobile liability insurance, a meeting of insurance company representatives and agents was held at the Hotel Astor. Following a lengthy discussion it was decided to take no definite stand at this time but to appoint a committee of nine to draft resolutions and submit them at a later meeting.

Some opposition was voiced to compulsory insurance as a state measure. Proposed laws in Massachusetts, New Jersey and Pennsylvania were outlined.

EMIL F. PETERSON DEAD

BUFFALO, Dec. 27.—Emil F. Peterson, general manager of the City Garage Co. and treasurer of the 600 Gas Stations, Inc., died recently in a Jamestown hospital at the age of 55 years. He was treasurer of the Automobile Dealers' Association of Jamestown and prominent in affairs of that city.

November's New Car Sales for Indiana Below Month in 1923

INDIANAPOLIS, Dec. 29.—The sale of new cars for Indiana for the month of November hit a lower level than was established a year ago. But actual sales were probably higher than registration figures shown for new-year license plates are obtainable in Indiana by Dec. 12 and many cars bought in November are not entered for registry until December. This always gives the December figures a better showing than real sales would justify. It is noted that while the total sale of new cars and trucks for the state was 3319, the registrations from Marion County (Indianapolis) was 588, a slightly better average than the city has held when compared to the state for several months. Reports from a number of important distributors show that December sales in their lines are rather better than the record of a year ago. New models of the better class closed vehicles seen to be selling more rapidly than the lower priced vehicles.

H. R. BLISS RESIGNS

NEW YORK, Dec. 29.—H. R. Bliss, vice-president and general manager of the Stratton-Bliss Co., handling the Oakland in the Metropolitan area, has resigned from the company due to ill health. Mr. Bliss will reside on the farm he recently purchased in Connecticut.

Uses Airplane to Get Publicity

SAN FRANCISCO, Cal., Dec. 29.—An airplane is one of the factors of the advertising department of the Chester N. Weaver Company, local Studebaker distributors. On many occasions, such as automobile races, football games, etc., the Weaver plane takes the air, carrying on its lower wing surfaces the word Studebaker in letters six feet tall. Recently the plane was sent up at noon and dropped several thousand handbills over the crowded business district. On one side was printed the slogan; "Use More Air Mail;" and on the other side appeared the sentence; "Just as Air Mail Is the Last Word in Postal Service—So the New Studebaker Is the Last Word in Automobiles."

Indianapolis Changes Affect Distribution of Leading Lines

**Ehrich and Malarky Take on Reo
While Ray Organization Signs
for Paige-Jewett**

INDIANAPOLIS, Dec. 27.—Two important changes in distributing for leading lines have been introduced here, affecting Reo and Paige-Jewett. The Wildhack Company which has been Reo distributor for this territory several years withdraws from this field and George Wildhack, president of the old Wildhack Company is to confine his endeavors to management of the General Chevrolet Company in which he has been active for the last year.

The new Reo company is styled the Reo-Ehrich-Malarky Company and will distribute Reo's at the old stand, having taken over the Wildhack lease. Both Wm. Ehrich and Joseph J. Malarky have had extensive Reo training.

George D. Ray, Inc., has been named the new Paige-Jewett distributor and will launch his new company here in a short time, although he is now actively on the scene. Mr. Ray comes from Paterson, N. J., with his entire organization that for nine years has been Paige distributor there with a splendid record. Of the staff which comes to Indianapolis with Mr. Ray are Harry Morris, secretary of the company, John D. Orr, in charge of the wholesale department and Clarence Berry, retail salesmanager. Newcomer Brothers who have handled the Paige line during the last year have not yet announced their plans for the future, but it is understood that they will continue in automobile sale and distributing business.

HAVE ELABORATE OPENING

KENOSHA, Wis., Dec. 29.—The Greiner-Nash Company, southeastern Wisconsin representatives of the Nash Motors Company, opened a new sales and service building here with elaborate formality. Officials of the Nash Motors Company here joined with George W. Greiner, president of Greiner-Nash, in acting as hosts to the many friends who called to inspect the new building. Hundreds "said it with flowers" and the salesrooms were transformed into a bower of flowers on the first day.

ANNOUNCE FLAT RATE PLAN

CINCINNATI, Dec. 29.—The Gilbert Chevrolet Sales Company, at 2352 Gilbert avenue, of which Ford Veazy is president and general manager, announces a new flat-rate method of charging for service. "Bring in your car at night," it advertises, "and it will be ready to drive in the morning." The customer is told in advance what the price will be for the entire service needed, thus obviating dis-appointment as to the size of the bill.

S. A. E. Members See Spectacular Tests at Underwriters' Laboratories in Chicago

CHICAGO, Dec. 27.—Between 90 and 100 members of the Society of Automotive Engineers were guests recently at the Underwriters' Laboratories, where products of all sorts are tested and rated. Starting originally as a testing laboratory on fire protection devices, the laboratories have broadened their scope until now they cover a multitude of devices which have to do with a hazard of any sort.

Several spectacular tests were made, one being extinguishing a gasoline fire by means of a foam-type extinguisher. Two gallons of gasoline were poured on top of water in a four-foot diameter receptacle and then ignited. After an interval of a few seconds the extinguisher was started and soon had the fire under control.

Another test of interest to the automotive engineer was made on a bumper of the spring type. This was mounted on a frame, bolted to a heavy foundation, and a large bullet-shaped weight was then allowed to run down an inclined track and crash into the center of the bumper. The purpose of such a test is not only to see what happens to the bumper but also to determine how much of the shock is absorbed in the bumper itself and how much is transmitted to the car, and in order to get this data a special type decelerometer is being worked out, to make more accurate rating of bumpers possible.

In another part of the laboratory a test for breakdown was being made on a spark plug to see the durability of the insulation. A vibration test was being made on gasoline tank gage and fittings, the vibration being made similar to that at the back of a car, where the tank is commonly mounted. A test was being made on a horn and an ammeter, both of which were mounted and vibrated much as they would be on the dash of a car, where unbalanced forces cause excessive vibration at certain speeds. Other tests were being made on locks, designed to make a car more thoroughly protected against theft.

Swing Upward Is Expected in Cincinnati After Local Show

CINCINNATI, Dec. 29.—While 1925 has not been as good a year as was hoped for at its beginning, it has turned out to be better than was expected at its middle. Sales were low during the first six months of the year, but on the seventh month they picked up and with the improvement which took place each successive month, the average was brought up to a point that is pronounced fairly satisfactory. This, of course, is speaking in general terms, and some dealers, naturally, did better than others.

There will be a lull, it is thought, until the opening of the local automobile show, which commences Jan. 10. From then on it is expected that the volume of sales will take an upward tendency.

BUILD LARGE STORAGE PLANT

ATLANTA, Ga., Dec. 27.—A building permit for the construction of what will be one of the largest automobile storage plants in the South has been awarded the Atlanta Auto Hotel Co., the building to be six stories in height and erected at a cost of \$400,000, according to the permit. Construction of the plant is already under way.

COMPLETING SHOW PLANS

SPRINGFIELD, O., Dec. 29.—Plans are being completed for an automobile show at Memorial Hall Jan. 19 to Jan. 24 inclusive. Don Smith, general chairman, says at least ten dealers will make exhibits. Approximately 40 cars will be on the floor. The hall will be attractively decorated.

ROLLIN BRANCH ANNOUNCED

SAN FRANCISCO, Cal., Dec. 29.—Establishment of a factory branch by the Rollin Motors Co. has been announced by E. B. Wilson, Rollin Pacific Coast manager. The Rollin car will be handled retail in San Francisco by the Rollin Motors Co., while dealers throughout the territory will have the advantage not only of dealing on direct factory contracts with the eastern factory, but will also have the benefit of the advice and counsel of the Rollin sales officials here.

When Junk Is Junk and Not a Car

BALTIMORE, Md., Dec. 27.—Reversing a recent decision of the traffic court, Judge Robert F. Stanton, in the Maryland criminal court, has ruled that motor vehicle laws do not apply alike to cars operated under their own power and those being towed. The ruling was made in the case of a negro youth who was fined for having a junked automobile towed through the streets without proper license tags and no operator's permit.

The boy was sent to jail, in default of his \$10 fine, because he did not have the necessary permit to steer the towed car, which was without engine, top, fenders or tires. The upper court, in overruling the lower court, declared that an automobile in such condition could not be classified the same as a car driven under its own power and criticised the lower court for its conviction of the driver or steerer of the towed car.

Interesting Discussions to Be Heard at Service Conference

Basing Flat Rate Charge and Piece Work Pay Topics on N. A. D. A. Section's Program

CHICAGO, Dec. 31.—"How to Develop the Basis for Flat Rate Charges and Piece Work Pay," will occupy the attention of automobile dealers and service managers at the Service Section Conference of the National Automobile Dealers' Association convention Hotel La Salle, Chicago, Jan. 26-29, according to announcement by C. A. Vane, general manager of the association. For the first time in the history of the national convention, an open forum discussion on automobile service will be undertaken, the entire morning of Thursday, Jan. 29, having been set aside for this purpose.

The service section will be presided over by Lynn M. Shaw, assistant general manager of the National Automobile Dealers' Association, who for many years was the general manager for a large Cadillac distributor in the east. Mr. Shaw came to the National Association because of the extended opportunity to study service and repair shop methods all over the country. He has analyzed the service methods of thousands of dealers.

Father of Flat Rate Idea

"Flat Rate Repair Charges" were first offered to the automobile trade by the National Association in 1919 when P. E. Chamberlin "Father of the Flat Rate" idea, was sent by the association throughout the country telling dealers everywhere of the principle involved. Today thousands of dealers are operating on this basis.

The new feature of flat rate charges however which has been developed in the last two years has been the application of piece work pay to the mechanic to the flat rate charge to the customer. How to determine the basis of these charges will be developed in the conference. Mr. Shaw will have the cooperation in this section of Frank R. Tate, Dodge Brothers dealer in St. Louis, one of the oldest users of both systems in the business, and of J. James MacGregor, Cadillac distributor of St. Louis, a certified public accountant and systems man who has had years of practical experience in working out such problems.

Other convention subjects will be those of sales, management, financing, and used cars.

SHIFTS IN DEALERSHIPS

RACINE, Wis., Dec. 22.—The Racine (Wis.) Motor Service, C. N. Pendleton, manager, has relinquished the Oldsmobile and will concentrate on the Hupmobile. The Oldsmobile franchise has been placed with the Lauson Motor Co., 822 Sixth street, Racine, which has been representing the Chevrolet. The Lauson company will continue handling Chevrolet parts until a new dealer is appointed.

Approve Move to Fix State's License Fees on Weight Basis

Automobile Manufacturers and Dealers of Michigan Join in Effort to Change Rating System

DETROIT, Dec. 29.—Proposed changes in the Michigan license law whereby the fees would be fixed entirely on a weight basis and the horsepower rating eliminated, were indorsed in a letter to the secretary of state from a committee of automobile manufacturers and officers of the state and Detroit dealer associations. The committee further declared that it is not opposed to a gas tax provided the revenue is used to reduce the license fee.

Committee Personnel

Members of the committee are Arthur T. Waterfall, vice-president Dodge Brothers, Inc., Alvan Macauley, president Packard Motor Car Co., C. S. Mott, vice-president General Motors Corp., H. H. Rice, president Cadillac Motor Car Co., representing manufacturers, and W. P. Staebler, president of the Michigan Automotive Trade Association, and A. L. McCormick, president of the Detroit Automobile Dealers Association, representing dealers.

All money derived from license fees and gas tax should be used for no other purpose than highway building and maintenance, the committee declares. The state would have available about \$10,000,000 for its yearly building program, which the committee feels is more than justifiable and in fact imperative.

In stating its favor of a change to a fee based entirely on weight, the committee declares its belief that trucks should be required to pay more per hundredweight than passenger cars. The committee calls attention to the fact that small cars are now paying at the rate of 70 cents per cwt. and if all motor vehicles in the state were made to pay on the same basis, not more than 40 per cent would pay more than at the present time.

Los Angeles Registrations Show Large Drop in Sales

LOS ANGELES, Dec. 27.—The report of registrations of new motor vehicles for November indicate that sales activities have continued on the downgrade. For the first eleven months passenger cars showed a loss of 29 per cent over 1923. For the same period commercial vehicles showed a loss of 20 per cent. Passenger cars in November lost 48 per cent over the same month last year and 16 per cent over October, 1924. Commercial vehicles lost 26 per cent over last November and 22 per cent over October, this year.

Lower priced cars were among the heaviest losers. Dealers claim to be unable to explain the situation except by saying, "They aren't buying."

Dealer Uses Radio to Get Interest

SPRINGFIELD, O., Dec. 29.—Radio now is being used by C. F. Sharpe, head of the C. F. Sharpe Motor Co., representative of the Reo Company, to create interest in Reo cars. A radio set has been installed at the local show rooms, 221 W. Main street, where programs are given at least three times a week. The programs given at the radio station of The Reo Motor Co. at Lansing, Mich., are heard as well as those from other points. Dance music is scheduled for every Saturday night and church music on Sunday.

Morgan Company Expert Chief Speaker for N. A. C. C. Banquet

NEW YORK, Dec. 27.—Dwight W. Morrow of the firm of J. P. Morgan & Co. will be the principal speaker at the banquet of the National Automobile Chamber of Commerce at the Hotel Commodore on Jan. 6. Mr. Morrow is an authority on financial questions and is an outstanding speaker on finance and business.

Neal O'Hara, columnist of the New York Evening World and well-known as a humorist, will also occupy a prominent place on the program for that evening.

Not the least important of the features is the annual presentation of medals to leaders of the industry for specific achievements during the year.

Arrangements are rapidly being concluded for the banquet which is expected to see an attendance of 800 persons identified with the industry. Walter P. Chrysler is chairman of the committee and associated with him are Harry H. Bassett, F. C. Chandler, Roy D. Chapin, A. R. Erskine, Myron E. Forbes and Harry M. Jewett.

Trip Abroad Gives Frisco Show Manager New Decoration Ideas

Golden Gate to Be Mecca for Many West Coast Tradesmen During February Event

SAN FRANCISCO, Dec. 29.—The next big event on the automotive program is the ninth annual Pacific Automobile Show, which is to be held in the Exposition Auditorium here Feb. 21 to Feb. 28.

The exhibit will be the most elaborate and the most complete automobile display ever held in this city, according to officials of the forthcoming exposition.

The show will be managed by George Wahlgreen, who for many years past has been in charge of the San Francisco displays.

A trip to Europe and a visit to the many expositions which are annual features of England and the Continent resulted in giving the San Francisco show manager some new ideas of decorative effects which will be used in the forthcoming automobile exhibit.

Dealers and distributors are already making plans to secure the very latest offerings of the year for display here.

During February this city will be the Mecca for scores of automobile men from all coast points, who will come in not only to see the coast display but also to attend the many trade conferences which will be held here during show week.

CHANDLER DEALERS NAMED

CLEVELAND, O., Dec. 29.—The Chandler Motor Car Co. has appointed the following new dealers:

Koke Sales Co., Boulder, Colo.; Motor Car Sales, Inc., Wilmington, Del.; Automotive Sales Co., Inc., St. Petersburg, Fla.; Ira G. Leedy, Cerro Gordo, Ill.; Marmon Worcester Co., Worcester, Mass.; Mitchell & Mitchell, Kalamazoo, Mich.; Auto Distributing Co., Plainfield, N. J.; Riley Brothers, Bridgeton, N. J.; Charles E. Abele, Peekskill, N. Y.; Court Garage, White Plains, N. Y.; C. L. Boss Automobile Co., Portland, Ore.; Rossmelise & Wagner Co., Appleton, Wis.; Four Lake City Garage, Madison, Wis.

Rickenbacker Distributor Seeks Aid of Owners and Others in Listing Prospects

ST. LOUIS, Mo., Dec. 27.—A new system of obtaining prospects has been put into operation by the Diesing Motor Sales Co., St. Louis Rickenbacker distributor. A book of 10 postal cards addressed to the Sales Promotion Department of the Diesing company is being distributed to Rickenbacker users and other friends of the company. On the back of the card are places to insert the name of a prospect, his address, the kind of car he now is driving, and the name of the person mailing the card.

Each book is numbered for identification purposes and when a card is filled out with the name of a possible buyer the name is entered upon a ledger to the credit of the party sending it in. Should a sale result within six months the Diesing company pays the "scout" \$25. It is not necessary to divulge the name of the person informing the company of the prospect's name for the salesman who is sent after the owner does not know where the "tip" comes from, except that his company furnished him with it.

While the system has been in operation but a short time the Diesing company is well pleased with it. It is expected to prove more efficient as the books become more widely distributed.

With the Associations

Salesmanagers Name Officers

DETROIT, Dec. 29.—Officers of the Detroit Automobile Salesmanagers' Association for the coming year are as follows: Lee W. Force, Reo Michigan Sales, Inc., president; James A. Grier, Cadillac Motor Car Co., vice-president; H. H. Shuart, Detroit Automobile Dealers' Association, secretary; M. Chandler Hart, Paige Sales & Service, treasurer. Directors are the above and T. M. Walker, Williams & Hastings, Inc.; L. E. Colgrove, Detroit Oakland Sales & Service; C. W. McGannon, Bemb-Robinson Co., B. L. Myers, Potts Motor Sales; Fred Beelby, Cunningham-Richards Co.

At the first meeting of the new officers and directors a program of wide activity and constructive development was outlined for the year. The feeling of the association is that sales managers of retail sales organizations must work together in certain ways to meet unusual market conditions and prevent the growth of improper practices.

Exhibit Week Set

WILMINGTON, Del., Dec. 29.—Wilmington will have its annual automobile show the week of Jan 26, this date having been set by the Wilmington Automobile Trade Association. The show will be held in the Gold Ballroom and DuBarry Room of the Hotel du Pont, which is in the heart of the business district.

The following committee has been appointed to make the necessary arrangements: Daniel Buckley of the Buckley Motor Co., Ford agents, chairman; Henry F. Seltzer of the Foss-Hughes Co., Harry R. Loose of the Paige and Jewett agency, and Frank Diver of the Wilmington Auto Co.

Ford Dealer Gets Presidency

PORT HURON, Dec. 27.—Albert B. Parfet, Ford dealer, was elected president of the Port Huron Automobile Dealers' Association at the annual meeting and an offer of his building for the automobile show during the first week in March was accepted. Bert B. Hyde, Maxwell-Chrysler dealer, was elected vice-president; Earl L. Paige, Chevrolet dealer, was re-elected secretary, and George Yokum, Buick dealer, was elected treasurer.

Hear About Aviation

INDIANAPOLIS, Dec. 27.—Indiana Section S. A. E. held its biggest and most successful meeting of the fall season with Maj. E. L. Hoffman, U. S. A., of the Cincinnati Air Port, as one of the head-liners. He described "Recent Aviation Developments at McCook Field," where he was formerly stationed in charge of engineering in one of the important sections of the development work there.

"Superchargers," described by Dr. Sanford A. Moss of the General Electric Co., filled the latter half of the evening. His part of the program brought out many questions regarding details.

A resolution was presented pledging the society to aid legislators in devising proper and scientific headlight provisions to be presented to the coming session of the Indiana legislature. Chairman F. F. Chandler was instructed to appoint a committee to begin such work shortly.

Truck Body Elects

NEW YORK, Dec. 29.—Joseph Husson, general manager of the Motor Truck Association of America, was elected president of the organization at the annual meeting held in this city. Other officers chosen are as follows:—First vice-president, Hermann Irion, Steinway & Co.; second vice-president, Charles M. Geiger of Peter Doelger; third vice-president, Thomas R. Freebody, Louis K. Liggett Co.; secretary, C. M. Billings, Vacuum Oil Co.; treasurer, Nat Mallouf, Mallouf Haulage & Maintenance Co.

D. C. Fenner, Mack Trucks, Inc.; E. E. La Schum, American Railway Express Co.; L. E. Campbell, La Lance & Grosjean Manufacturing Co., and Emanuel Lascaris, George W. Goethals Co., directors for three years.

John Stilwell, Consolidated Gas Co. of New York, director for two years.

Herman J. Harms, Otto Stahl, Inc., director for one year.

Bishop Elected President

BALTIMORE, Md., Dec. 27.—The following officers for the ensuing year were elected at a recent meeting of the Baltimore Automobile Trade Association: President, A. H. Bishop; Vice-President, E. T. Backus; Treasurer, W. F. Kneip. Directors—A. H. Bishop, E. T. Backus, Louis Fox, E. R. Myers, W. F. Kneip, Thomas W. Wilson, Jr., A. Stanley Zell. John E. Raine is secretary.

The association is planning to make its forthcoming show the most pretentious ever held here, notwithstanding there will be fewer cars exhibited than heretofore. The show will be held Jan. 17-24.

25 Years Ago In the Automobile Industry As Recorded In MOTOR AGE

Automobile Fire Engines

The experiments of "Capitaine Ingenieur" Cordier with automobiles in connection with the Parisian fire department has proven so satisfactory that six additional electric machines have been ordered, including a hook-and-ladder, pumping engines and hose trucks. These will be used in connection with the exposition this summer.

Plan French Race

A cable dispatch announces that Pau, France, is to have a series of automobile races. W. K. Thorne is arranging the races for the end of February. Baron de Zuyler has accepted the position of president d'honneur, Mr. Thorne being the local president. The total added money will be no less than 14,000 francs. The town of Pau is generously giving 5,000 francs.

The dates fixed are Feb. 22 to Feb. 27, inclusive. On Feb. 25 the great event will take place over a distance of 335 kilometers (about 210 miles), the itinerary being Pau, Tarbes, Naubourgne, Dax Bayonne, to Pau. If big automobiles come a speed of 64 kilometers (40 miles) an hour will probably be made.

To Examine Drivers

Chairman Ellicott of Chicago's automobile commission has set the present week for the opening examination of motor carriage drivers. It is rumored that the commission has decided that steam carriages will be entirely barred from the city, but no confirmation of the rumor can be obtained, Chairman Elliott refusing to discuss the matter for the present. A rather serious accident in which a pedestrian was knocked down by one of the electric cabs may have the effect of mak-

ing the restrictions of the commission extra severe.

Automobile Livery for Cleveland

An automobile livery is under installation in Cleveland. The old athletic club house has been leased by an attorney who reports that he represents Chicago capitalists. It is stated that patrons of the livery will be allowed the option of renting rigs by the year, month, day or hour.

HEADS AUTOMOBILE CLUB

ROCHESTER, N. Y., Dec. 29.—Charles F. Gallagher, Studebaker distributor in this territory, was elected president of the Rochester Automobile Club at the annual meeting this week.

RELINQUISH CONTRACT

JOLIET, Ill., Dec. 27.—The Will County Motor Car Co. of Joliet announces that it has relinquished its contract as Chevrolet dealer, which connection it held for seven years.

Trade of Southeast Sees Slight Pickup in Business

Distributors Base Hope for Greater Activity Early Next Year on Cotton Outlook

ATLANTA, Ga., Dec. 27.—Automotive sales conditions in the Southeast appear to have been improving a little the past two or three weeks, with a fair demand reported for closed cars, but regarded as a whole larger distributors state that the volume of business is still running somewhat below that of the corresponding period last season with the exception of Ford sales, which are showing a very good improvement.

The outlook is regarded by distributors as very good for the early part of 1925, due to the large cotton crop produced and the fact that prices are holding to a good price level around 23 cents a pound.

Accessory and equipment sales in the larger southeastern cities are reported the best they have ever been at this time, especially in Atlanta where the association conducted a co-operative advertising campaign based on the slogan—"Something For The Car For Christmas." Jobbers also report that accessory and equipment sales in the smaller towns and communities have been unusually good in most parts of the Southeast this year.

CAPITALIZED AT \$100,000

CINCINNATI, O., Dec. 29.—The Cincinnati Auto Sales Co., has been incorporated with a capital of \$100,000 to wholesale and retail automobiles and trucks. Walter E. Schott, Harold J. Closterman, William J. McCauley, James R. Clark and Burton E. Robinson are the incorporators.

Sixteen Year Accomplishment of Ford Motor Co. Written Into U. S. Senate Record

WASHINGTON, Dec. 27.—The 16-year record of the Ford Motor Company, from 1908 to 1923, became a part of the United States Senate official record when the Senate set aside a special day for consideration of the Ford offer for the purchase of Muscle Shoals. Mr. Ford withdrew his offer in a letter to the President, Oct. 15, but there is hope here that it will be renewed.

The 16-year record of achievement was inserted in the record as evidence of the belief that Henry Ford holds the economical solution of what to do with the property and that his record is indicative of what he might be able to do with the project.

The statistics, which were furnished Senator Edwin F. Ladd of North Dakota, by the Ford Motor Co. itself, are as follows:

16-Year Record of the Ford Motor Co.

Farmer as Buyer Raises Standing

WASHINGTON, Dec. 29.—The purchasing power of the American farmer today is at its highest level for any time during the past four years, according to the annual report of the Department of Agriculture, submitted to the President.

The report reveals that the present purchasing power of the farmer is 16 per cent above the index for May, 1921, but is still 18 per cent below the pre-war level.

The 1924-25 crop will be worth \$12,000,000,000, it is estimated. This is \$500,000,000 more than last year's crop was worth and is \$2,500,000,000 more than the 1921-22 crop.

PREPARE FOR EXPANSIONS

MONTREAL, Can., Dec. 27.—Consumption of its plan for the sales and service of Maxwell and Chrysler cars in Montreal and vicinity to care for rapidly expanding business possibilities there is announced by the Maxwell-Chrysler Motor Company of Canada, Ltd., through John D. Mansfield, president and general manager. It is made coincident with the company's announcement of the appointment of the Packard-Montreal Motor Co., Ltd., and the Canada Motor Car Co., both of Montreal, as sales outlets for the city and adjacent territory. Located in different parts of the city, both companies will distribute these makes in Montreal proper. The Packard-Maxwell company will handle the wholesale business throughout the territory, as well as a complete stock of parts and service equipment.

Car and Truck Output for November Reached 237,234

Month's Production of Passenger Vehicles Shows Decline of 89,660 Below 1923 Period

WASHINGTON, Dec. 27.—Automobile production in November totaled 222,127 cars and trucks, compared with 313,024 units in November, 1923 and 237,334 in November, 1922. Detailed figures compiled by the U. S. Department of Commerce, based on reports from 204 manufacturers, 99 of which make passenger cars and 134 trucks (29 making both passenger cars and trucks) show that the passenger car production with 195,279 in November, compared with 257,915, in October—a loss of 62,636, against a decline of 50,102 in November of last year compared with October, 1923 production of passenger cars of 335,041. With the exception of June, 1923, October of last year marked the record production, being only 2,000 cars less than the June, 1923 passenger car production.

Comparing November production of cars with that of previous year, the figures show a decline this year of 89,660, compared with November, 1923 and a loss of 20,083 when compared with the same month of 1922. The production, month by month, for 1923 and 1924 with comparisons, was as follows:

AUTOMOBILE PRODUCTION (Number of Machines)

	Passenger Cars		Trucks	
	1923	1924	1923	1924
Jan.	223,822	287,353	19,739	28,920
Feb.	254,782	336,371	22,178	31,161
March	319,789	348,356	35,298	34,138
April	334,661	337,045	38,102	36,169
May	350,460	279,455	43,757	33,421
June	337,442	217,935	41,176	27,894
July	297,413	237,668	30,708	*25,252
Aug.	314,431	251,551	30,884	*27,524
Sept.	298,964	260,171	28,592	*30,810
Oct.	335,041	*257,915	30,153	*31,455
Nov.	284,030	195,279	28,085	26,848
Dec.	275,472		27,772	

*Revised.

Clutch Plate Exchange Offer Lincoln's New Relining Plan

DETROIT, Dec. 27.—In order to relieve its dealer service station of the job of relining clutch plates, the Lincoln Motor Co. has put a plan into operation whereby dealers can exchange a set of clutch plates in need of relining for a set relined at the factory at a cost to the car owner of \$6.50.

After riveting new lining to the plates it is necessary to compress them to make sure that the assembly will be the correct thickness. Through lack of proper equipment dealers have been experiencing trouble in doing this work properly. To avoid such difficulties the factory is now offering to do this work on an exchange basis as it has all the necessary tools for straightening, riveting and compressing the clutch plates. Both the plain and the lined plates are included in this exchange as the former are sometimes warped and need straightening before installation.

Year	1908-1923		Average Daily	
	Price of Model "T" Touring Car	Per Cent Reduction from 1908	Wage Paid	Per Cent Increase Over 1908
1908	\$950	—	\$2.25	—
1909	780	18	2.14	*5
1910	690	27	2.40	7
1911	600	37	2.28	1
1912	550	42	2.25	0
1913	490	48	2.43	8
1914	440	54	4.41	96
1915	360	62	4.40	95
1916	360	62	4.41	96
1917	450	53	4.95	117
1918	525	45	5.31	136
1919	575	39	6.11	171
1920	440	54	6.72	198
1921	415	56	6.91	207
1922	348	63	6.65	195
1923	295	69	6.62	194

*Decrease.

Would Base Oregon's Motor Taxes Upon Value of Vehicles

Banning Speed Trap Among Subjects for Consideration at Coming Legislative Session

PORTLAND, Ore., Dec. 29.—Tax the automobile upon the basis of its value, and not solely upon its weight or a fictitious assessment of its horse-power. This is the plea which is to be made before the coming session of the Oregon state legislature, which is scheduled to meet in January, 1925.

The plan is the result of extensive investigation of automobile license fees in this state conducted by a committee named by the governor to report to the next session of the Oregon assemblymen. It is intended primarily as a measure of relief for the farmer. It includes the preparation of a sliding schedule of depreciating values, inversely proportional to the age of the car. An actual personal property tax is frowned upon, but the schedule will be presented as a substitution for the license fees.

Passage of a "certificate of public necessity" provision in the regulation of auto stages and bus lines is also proposed. This virtually amounts to a franchise for the existing lines, and would relieve them from the difficulties of spasmodic competition in places where the traffic is not sufficiently heavy to support more than one line.

Banning of the speed trap is another thing that is to be attempted. Although no definite bills have been drawn embracing changes in the court system, it is probable that the association will also recommend the placing of all traffic matters under the control of the state. This would give the state department of traffic jurisdiction over country and local traffic enforcement men and provide for the establishment of special courts under state control, in the larger centers.

Chevrolet Sales Managers in Annual Winter Conference

DETROIT, Dec. 27.—Chevrolet district sales managers from all parts of the United States were in session last week in this city and Flint, for the annual mid-winter conference. Among the attendants were 23 zone sales managers and five regional sales managers, with R. H. Grant, vice-president and general sales manager, and C. E. Dawson and D. S. Eddins, assistant general sales managers. W. S. Knudsen, president of the company, attended the closing session which was held in the Hotel Durant, Flint.

NAMED BRANCH MANAGER

SPRINGFIELD, Mass., Dec. 27.—D. Herbert Musselman, for several years identified with local automobile concerns, has been appointed manager of the Springfield branch of the Long Motor Sales Co.

Challenge U. S. Right to Destroy Car

WASHINGTON, Dec. 29.—A suit, the first of its kind ever filed here, has been brought in the District Supreme Court for the seizure and destruction of an automobile which was seized last September from a bootlegger. The car was fitted up with a smoke screen and was characterized by the United States Attorney as a "combat conveyance of the touring automobile type, with defensive smoke screen device and armored gas tank."

The United States Attorney holds that an automobile, so equipped, is a "combat" vehicle, thus making it fall in the category of "dangerous weapons," which under the Federal laws must be destroyed. If the libel against the vehicle is sustained by the court, the automobile will be destroyed.

Balloon Shipments Increased in October, High Pressures Off

NEW YORK, Dec. 27.—Shipments of balloon casings and tubes increased during October as compared with the previous month, according to statistics compiled by the Rubber Association of America, while those of high-pressure tubes and casings declined.

Statistics for the two months follow:

HIGH PRESSURE INNER TUBES.			
	Inventory.	Production.	Shipm'ts
Sept.	5,153,778	5,039,594	4,823,039
Oct.	6,464,783	5,466,553	3,872,813
BALLOON INNER TUBES.			
Sept.	885,000	466,848	357,765
Oct.	887,417	429,244	402,103
HIGH PRESSURE PNEUMATIC CASINGS.			
Sept.	2,731,376	2,077,350	1,959,306
Oct.	3,279,383	2,276,134	1,779,232
BALLOON CASINGS.			
Sept.	850,430	479,755	398,324
Oct.	809,824	485,371	454,117
PNEUMATIC CASINGS—FABRIC.			
Sept.	942,500	973,764	1,046,609
Oct.	1,159,173	1,115,571	913,412
SOLID AND CUSHION TIRES.			
Sept.	179,927	54,106	59,581
Oct.	182,400	58,938	58,078

GIVEN AUBURN AGENCY

TOLEDO, Dec. 29.—The Franklin-Auburn Sales & Service Co., 1106 Adams street, has been named Toledo dealer by the Auburn Motor Co., William F. Ehlert, is head of the new organization.

The territory includes two Michigan and six Ohio counties adjacent to Toledo.

CITY TESTS HEADLIGHTS

ST. LOUIS, Mo., Dec. 29.—An automobile headlight testing station is maintained by the city of St. Louis on the ground floor of the City Hall where a motorist may have his lights tested for a 25-cent fee.

Milton's Protest Against Hartz Culver City Victory Overruled

After Rechecking Score Sheet's Contest Board Chairman Holds Award Was Properly Made

LOS ANGELES, Dec. 29.—Tommy Milton's protest of the award of second place to Harry Hartz in the championship race at Culver City speedway has been overruled by Chairman Kennerdell, of the Contest Board of the A. A. A. Milton drove a non-stop race and Hartz stopped once for a tire change. Milton claimed Hartz could not have come back and finished ahead of him, but a careful recheck of the scorers' sheets and an inspection of the timing device failed to uphold his claims.

Hartz drove the final laps at a speed of 134.7 miles an hour, said to have been the fastest time ever made in competition.

Championship honors for 1924 were retained by Jimmy Murphy, who died as the result of an accident on the track at Syracuse. Earl Cooper was the only driver who had a chance to better Murphy's score for the year by winning at Culver City. He was eliminated early and Hill, who won, could not equal Murphy's figure piled up in earlier events of the year.

Credit for the tremendous speed made by the racers in this contest was given to the new track and the use of superchargers. In practice Hartz drove two laps in his car equipped with a supercharger at 135.4 miles an hour. The front-wheel drive Miller car that was entered in the race to be driven by Cliff Durant, of which much was expected, for several months.

Say Ajax Company Will Not Have Exhibit at N. Y. Show

RACINE, Wis., Dec. 29.—The Ajax Motor Company, the Nash subsidiary, which is planning production of a new automobile, will not have an exhibit of its product at the New York show, according to an announcement made here. It is understood that actual production by the Ajax company will not commence

According to James T. Wilson, vice-president, the new Ajax will not contain any striking innovations. It was designed to round out the Nash line in response to the general request of Nash dealers, who found that many prospects who feel they cannot afford to buy a Nash special or advanced six nevertheless want Nash-built quality if offered in a popular-price car.

At the same time that the Ajax is being perfected and made ready for production the Nash interests are increasing the capacity of the Kenosha main works about 25 per cent and the Milwaukee branch factory 50 per cent. The advanced six is made at Kenosha and the special six in Milwaukee.

Nash production in 1924 will be approximately 53,000 cars, compared with 56,000 in 1923.

Coming Motor Events

Automobile Shows

- Adams, Mass. Feb. 12-14
Adams-North Adams Automobile Show, Adams State Armory, J. J. Callahan, Pittsfield, Mass., manager.
- Albany, N. Y. Feb. 21-28
Annual Automobile Show, State Armory, under the auspices of the Albany Automobile Dealers' Association, L. B. Wood and L. Y. Long, managers.
- Allentown, Pa. Mar. 1-8
Allentown Automobile Show, Lehigh Automobile Trade Association, E. T. Satchell, president.
- Atlanta, Ga. Feb. 14-21
Passenger Car and Accessory Show, City Auditorium. Atlanta Automobile Ass'n.
- Atlantic City, N. J. Jan. 31-Feb. 7
Annual Automobile Show, Garden Pier, under the auspices of the Automobile Trade Association of Atlantic City, Harry Leiby, manager.
- Baltimore Jan. 17-24
Nineteenth Annual Automobile Show, Baltimore Automobile Trade Association.
- Binghampton, N. Y. Jan. 26-31
Annual Automobile Show, State Armory, Binghampton Automobile Dealers' Ass'n. H. Scottebo, Mgr.
- Boston March 7-14
Annual Show, Boston Automobile Dealers' Association, Chester I. Campbell, manager.
- Buffalo, N. Y. Jan. 10-17
Twenty-third Annual Automobile Show, Buffalo Automobile Dealers Association, Carlton C. Proctor, manager.
- Brooklyn Jan. 17-24
Annual Automobile Show Brooklyn Motor Vehicle Dealers Ass'n.
- Cadillac, Mich. (Date)?
Seventh Annual Passenger Car Show, Cadillac Garage Owners' Ass'n. Warren J. Hensh, Mgr.
- Charlotte, N. C. Feb. 9-14
Fifth Annual Carolina Automobile Show, B. D. Heath, Chairman Central Committee.
- Chicago Jan. 23-31, 1925
National Automobile Chamber of Commerce.
- Chicago Jan. 26-31
Twentieth Annual Automobile Salon.
- Cincinnati Jan. 10-17
Cincinnati Automobile Show, Music Hall Auditorium, under the auspices of Cincinnati Automobile Dealers Association.
- Cleveland, O. Jan. 17-24
Annual Show, Cleveland Automobile Manufacturers' and Dealers' Assn. Public Auditorium, Herbert Buckman, Manager.
- Columbus, O. Jan. 12-17
Automobile and Accessory Show of Columbus Automobile Dealers Company.
- Des Moines, Ia. Feb. 22-28
Annual Automobile Show Under Auspices of Des Moines Automobile Dealers Association.
- Detroit Jan. 17-24
Detroit Automobile Show, Detroit Dealers' Association.
- Elmira, N. Y. Jan. 19-24
Annual Automobile Show, New York State Armory, under the auspices of the Elmira Automobile Merchants Association, T. W. Keeton, chairman.
- Erie, Pa. Jan. 12-17
Erie Automobile Show, C. R. Cummins, Mgr.
- Evansville, Ind. Mar. 9-15
Annual Automobile Show, Evansville Automobile Show Association.
- Fitchburg, Mass. Jan. 29-31
Annual Show, State Armory, J. J. Callahan, Pittsfield, Mass. Mgr.
- Flint, Mich. Feb. 1
Automobile Show, Flint Dealers Association.
- Fort Worth, Tex. March 3-10
Third annual passenger car show. Fort Worth Auto Trades Ass'n Bldg.
- Hackensack, N. J. Jan. 17-24
Annual Automobile Show under auspices of Automobile Trade Ass'n. of Bergen Co. Moe Katzman, Mgr.
- Hartford, Conn. Feb. 21-28
Eighteenth Annual Passenger Car Show, Hartford Automobile dealers' Ass'n, Arthur Fifoot, manager.
- Indianapolis, Ind. Mar. 2-7
Annual Automobile and Accessory Show, Automobile Bldg., Indianapolis Automobile Trade Assn., John Orman, Manager.
- Grand Rapids, Mich. Feb. 9-14
Annual Automobile Show, Passenger Car Dealers Association, M. D. Elgin, manager.
- Kansas City, Mo. Feb. 7-14
Kansas City Motor Car Dealers' Association Show.
- Johnstown, Pa. Feb. 26-Mar. 7
Annual Automobile Show, Johnstown Automobile Dealers' Ass'n. H. Swank, Mgr.
- Lansing, Mich. Feb. 2-7
Annual Automobile Show, Lansing Automobile Dealers Association, Arthur N. Avery, manager.
- Louisville, Ky. Feb. 16-21
Louisville Automobile Show, Louisville Automobile Dealers Association, George T. Holmes, manager.
- Montreal Jan. 17-24
National Motor Show of Eastern Canada, Montreal Automobile Trade Association, Ltd., L. M. Hart, president.
- Milwaukee Jan. 17-24
Seventeenth Annual Automobile Show, Milwaukee Automotive Dealers Association, Bart J. Rudle, manager.
- Minneapolis Jan. 31-Feb. 7
Eighteenth Annual Twin City Automobile Show, Minneapolis Automobile Trade Association.
- Muskegon, Mich. Feb. 16-21
Muskegon Automobile Show, Muskegon Automobile Trade Association, J. C. Fowler, manager.
- Newark, N. J. Jan. 10-17
Eighteenth Annual Automobile Show, under the auspices of the New Jersey Automobile Exhibition Co., Chamber of Commerce Building. Claude E. Holgate, Manager.
- New Bedford, Mass. Jan. 28-31, Inc.
Annual Automobile Show given by New Bedford Trade.
- New York Jan. 2-10, 1925
National Automobile Chamber of Commerce.
- Omaha, Neb. Feb. 16-21, 1925
Twentieth Annual Omaha Automobile Show.
- Philadelphia Jan. 10-17
Twenty-fourth Annual Automobile Show, Philadelphia Automobile Trade Association, Commercial Museum.
- Pittsfield, Mass. Jan. 15-17
Pittsfield Automobile Show, J. J. Callahan, director.
- Pittsburgh, Pa. Jan. 31-Feb. 7
Twenty-ninth Annual Automobile Show, Motor Square Garden, under the auspices of the Automotive Association, Jno. J. Bell, Manager.
- Portland, Me. Feb. 23-28
Annual Automobile Show, Portland Automobile Dealers' Ass'n. Howard B. Chandler, Mgr.
- Portland, Ore. Jan. 31-Feb. 6
Annual Automobile Show, Multnomah Block, under the auspices of the Automobile Dealers' Association of Portland; Ralph J. Staehli, manager.
- Reading, Pa. Jan. 31-Feb. 7
Annual Automobile Show, Rajah Temple, under the auspices of the Reading Automobile Trade Association, George D. Barbey, secretary.
- Rochester, N. Y. Jan. 19-24
Annual Automobile Show, Edgerton Park Buildings, under the Auspices of the Rochester Automobile Dealers' Association, Inc., S. Park Harman, manager.
- San Francisco Feb. 21-28
Ninth Annual Pacific Automobile Show, Exposition Auditorium, under auspices Motor Car Dealers' Association of San Francisco. G. A. Wahlgreen, Manager.
- Scranton, Pa. Jan. 27-31
Annual Automobile Show, commercial cars; passenger cars, Feb. 2-7; State Armory, under the auspices of Scranton Motor Trades Association, Hugh B. Andrews, manager.
- St. Louis, Mo. Feb. 21-28
Annual Automobile Show, St. Louis Automobile Dealers Association, Robert E. Lee, manager.
- St. Paul Jan. 31-Feb. 7
Annual Passenger Car, Truck and Tractor Show. St. Paul Auto Trades Ass'n. Second Annual Passenger Car Show, Automobile Building.
- Syracuse, N. Y. Feb. 2-7
Seventh Annual Automobile Show, Syracuse Automobile Dealers Association. C. H. Hayes, manager.
- Trenton, N. J. Feb. 18-21
Automobile Show, Armory. Harry C. Woods, Mgr.
- Washington, D. C. Jan. 24-31
Annual Show to be held on both floors of Convention Hall under auspices Washington Automotive Trade Association. Rudolph Jose, Chairman Show Committee, 1138 Connecticut ave., Washington, D. C.
- Waterbury, Conn. Jan. 19-24
Automobile Show, Waterbury Dealers' Ass'n. Gus Parsons, Mgr.
- Wilkes-Barre, Pa. Jan. 26-31
Annual Automobile Show, Automobile Merchants' Ass'n of Wilkes-Barre, Norman Johnstone, Mgr.
- Worcester, Mass. Feb. 9-14
Annual Automobile Show, Worcester Automotive Association, W. R. Livingstone, manager.
- Youngstown, Ohio. Feb. 2-7
Third Annual Automobile Show, Rayen-Wood Auditorium, Youngstown Automobile Dealers Association. C. A. Baird, manager.

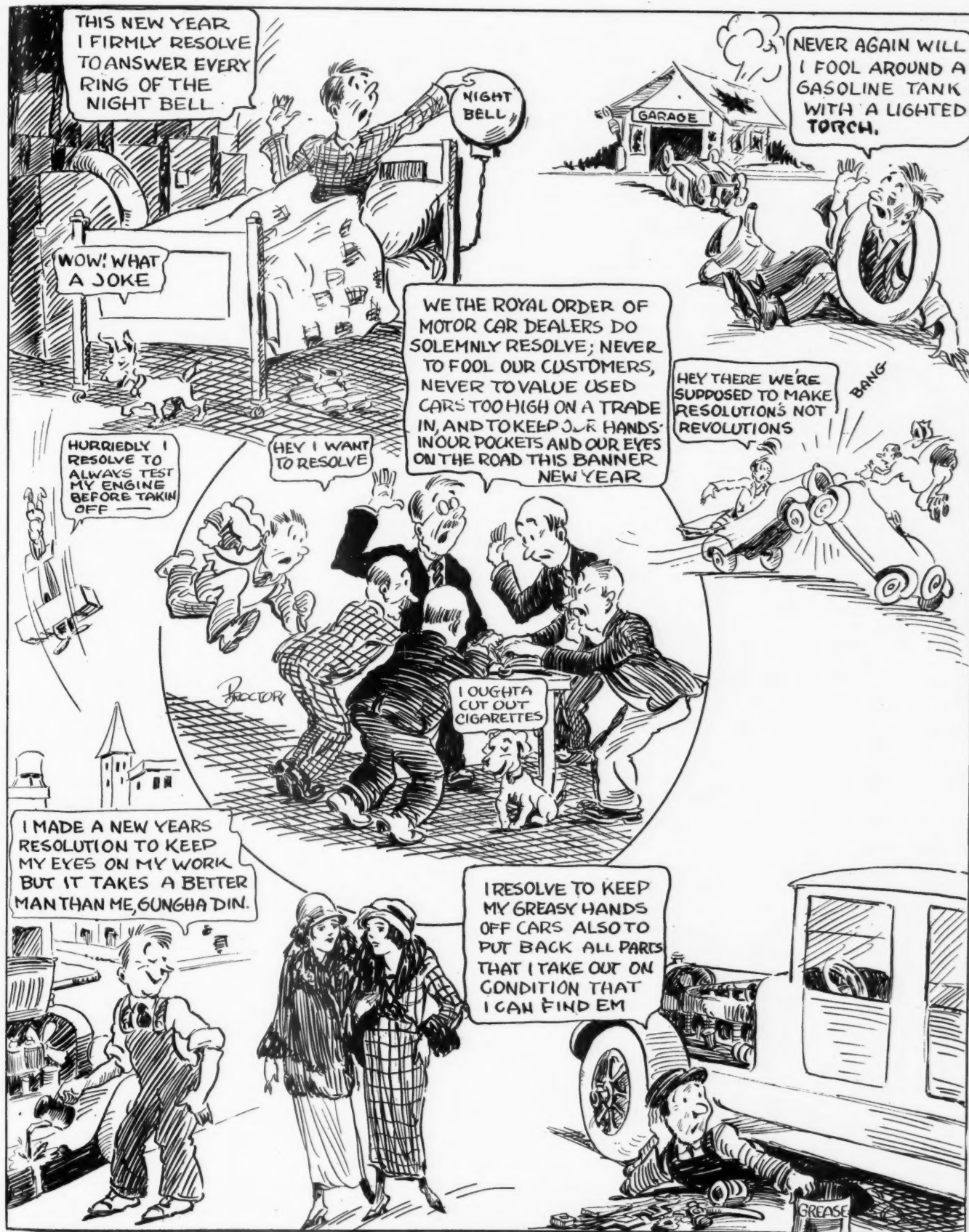
Conventions

- Chicago Jan. 26-29, 1925
Eighth Annual Convention, N. A. D. A., Hotel LaSalle.
- Chicago Jan. 26-29
Fifth Annual Meeting, Automotive Electric Service Ass'n. Congress Hotel.
- Colorado Springs, Colo. June 22-27
Summer Convention, Automotive Equipment Association, Broadmoor Hotel.
- Detroit Jan. 19-22
Annual Meeting of the Society of Automotive Engineers.
- Montgomery, Ala. Jan. 26, 1925
Annual Convention, Alabama Automotive Trades Association.
- New York City Jan. 5, 1925
New York Show, Meeting N. A. D. A., Hotel Commodore.
- New York Jan. 8
Annual Dinner, Society of Automotive engineers.

Foreign Shows

- Geneva, Switzerland March, 20-29
International Motor Exhibition.
- Melbourne, Australia April 22-May 7
International Automobile Show, Chamber of Automotive Industries and Royal Automobile Club of Victoria.

SQUEEKS *and* RATTLES



Prices and Weights of Current Passenger Car Models

Ship.	Wt. Pass. Body Style	Price	Ship.	Wt. Pass. Body Style	Price	Ship.	Wt. Pass. Body Style	Price	Ship.	Wt. Pass. Body Style	Price
AMBASSADOR "D-1"	3360 5-p Sedan	\$1,695				DORRIS "6-80"	4120 4-p Pasadena Tour.	\$4,150	GRAY "O"	1750 5-p Touring	\$630
AMERICAN "D-66"	2985 2-p Roadster	\$1,950				4115 7-p Touring	4,150		1735 2-p Coupe	750	
3175 4-p Sp. Roadster	2,050					4193 4-p Coupe	4,935		1880 3-p Coupe	845	
3260 5-p Touring	1,695					4200 5-p Sedan	5,550		2020 5-p Sedan	895	
3300 5-p Sport	1,850					4310 7-p Sedan	5,800		2130 5-p Sport Sedan	995	
3310 7-p Touring	1,760					DUESENBERG			H C S "G"		
3190 4-p Sp. Touring	1,885					3920 3-p Roadster	\$6,500		3750 4-p Touring	\$2,650	
3470 7-p Sedan	2,550					3700 5-p Phaeton	6,250		3950 4-p Coupe	3,350	
3310 5-p Brougham	2,195					3920 7-p Phaeton	6,750		4010 4-p Sedan	3,350	
ANDERSON "41"						3980 4-p Sp. Phaeton	6,500		HATFIELD "6-55"		
2650 5-p Touring	\$1,195					4000 4-p Coupe	7,500		3080 4-p Sport Touring	\$1,775	
2675 4-p Sp. Touring	1,445					4350 7-p Sedan	7,800		3225 4-p Coupe	2,175	
2925 2-p Coupe	1,425					DU PONT "C"			3300 5-p Sedan	2,350	
2875 5-p Sedan	1,695					3300 2-p Roadster	††		HAYNES "60"		
2925 5-p Sp. Sedan	1,895					3400 5-p Touring	††		3295 5-p Touring	\$1,600	
2975 7-p Touring	1,595					3600 5-p Touring Sedan	††		3725 5-p Sedan	2,300	
3200 7-p Sedan	1,945					3600 5-p Sub'n Sedan	††		3560 5-p Brougham	2,200	
APPERSON "6"						††Manufacturers do not quote list prices.			HUDSON "Super Six"		
3100 5-p Sp. Phaeton	\$1,695					DURANT "A-22"			3300 4-p Speedster	\$1,400	
3145 3-p Coupe	1,985					2235 2-p Roadster	\$1,080		3425 7-p Phaeton	1,500	
3280 5-p Sedan	2,095					2325 5-p Touring	830		3450 5-p Coach	1,345	
3470 5-p Sp. Sedan	2,295					2345 5-p Touring F.W.B.	940		3585 5-p Sedan	1,795	
3815 5-p Phaeton	\$2,485					2405 2-p Business Coupe	935		3675 7-p Sedan	1,895	
3900 7-p Phaeton	2,535					2495 4-p Coupe	1,160		HUPMOBILE "R"		
3955 5-p Sport Phaeton	2,800					2605 5-p Sedan	1,190		2595 2-p Roadster	\$1,225	
3815 5-p Sport Phaeton	2,900					2550 5-p Coach	1,050		2730 5-p Touring	1,225	
4180 5-p Sedan	3,485					ELCAR "4-40-41"			2760 2-p Coupe	1,350	
4200 7-p Sedan	3,585					2560 5-p Touring	\$995		2860 4-p Coupe	1,595	
4340 5-p Sport Sedan	3,750					2585 5-p Demi Sp. Touring	1,095		2975 5-p Sedan	1,800	
4380 7-p Sport Sedan	3,850					2641 5-p Sportster	1,195		2895 5-p Club Sedan	1,975	
AUBURN "6-43"						2779 5-p Sedan 3 d.	1,295		3135 5-p Touring	1,975	
2610 5-p Special Touring	\$1,395					2900 5-p Sedan	1,495		3295 4-p Coupe	2,325	
2760 5-p Sp. Touring	1,465					2981 5-p Sp. Sedan	1,695		3410 5-p Sedan	2,375	
----- 5-p Touring Coupe	1,695					2779 5-p Brougham 3 d.	1,265		JEWETT "23-25"		
2900 5-p English Coach	1,945					2829 5-p Sp. Brough. 3 d.	1,395		3000 5-p Touring	\$1,175	
----- 5-p Sedan 4 d.	1,595					----- "6-50-51"			2810 5-p DeLuxe Touring	1,290	
2885 5-p Sedan	1,795					2600 5-p Demi Sp. Tour.	1,220		----- 3-p Bus. Coupe	1,310	
3225 5-p Sp. Touring	1,895					2690 5-p Sp. Touring	1,420		3260 5-p Sedan	1,545	
3550 5-p Sedan	2,550					2779 5-p Sedan 3 d.	1,495		3095 5-p DeLuxe Sedan	1,745	
3510 5-p Brougham	2,395					2900 5-p Sedan	1,720		3230 5-p Brougham	1,385	
3550 7-p Sedan	2,550					2981 5-p Sp. Sedan	1,920		----- 5-p Sp. Brougham	1,525	
BARLEY "6-50"						2779 5-p Brougham	1,490		JORDAN		
2750 5-p Touring	\$1,395					2829 5-p Sp. Brougham	1,620		(120 in. W. B.)		
2800 5-p Sp. Touring	1,495					2007 5-p Touring	1,585		3420 5-p Brougham 4 d.	\$2,385	
3100 5-p Sedan	1,850					3380 5-p Sedan	2,245		3375 4-p Victoria	2,385	
3150 5-p Sp. Sedan	2,250					3675 5-p Sp. Sedan	2,395		(124½ in. W. B.)		
BUICK "Standard"						3880 4-p Brougham	1,995		3260 4-p Blueboy Touring	2,095	
2750 2-p Roadster	\$1,150					3000 3-p Roadster	2,315		Series "A"		
2800 2-p Roadster Encl.	1,190					3700 5-p Sp. Touring	2,165		3330 2-p Playboy Road.	2,575	
2920 5-p Touring	1,175					----- 5-p Sp. Touring	2,165		3340 5-p Touring	2,575	
2970 5-p Touring Encl.	1,250					4000 5-p Sp. Touring	2,265		----- 3-p Coupe	2,575	
2960 2-p Coupe	1,375					4000 5-p Sedan	2,865		3635 5-p Brougham	2,575	
3075 4-p Coupe	1,565					4050 7-p Sedan	2,765		3520 4-p Victoria	2,775	
3185 5-p Dbl. Service Sedan	1,475					ESSEX			3525 5-p Sedan	2,975	
3245 5-p Sedan	1,665					2130 5-p Touring	\$900		KING		
3050 5-p Coach	1,295					2305 5-p Coach	895		(120 in. W. B.)		
3285 2-p Roadster	\$1,365					FLINT "55"			3428 2-p Sportster	\$1,895	
3335 2-p Roadster Encl.	1,400					3095 3-p Sp. Roadster	\$1,630		3428 4-p Foursome	1,595	
3465 5-p Touring	1,395					3245 5-p Touring	1,595		3528 5-p Touring	1,595	
3540 5-p Touring Encl.	1,475					3310 5-p Sp. Touring	2,050		3645 3-p Coupe	2,000	
3770 4-p Coupe	2,125					3455 4-p Coupe	2,195		3875 5-p Sedan	2,400	
3850 5-p Sedan	2,225					3585 4-p Sedan	2,285		3400 5-p Road King Sedan	1,495	
3560 5-p Coach	1,495					2400 5-p Touring	1,075		----- 4-p Sedanette	1,995	
3485 3-p Sp. Roadster	\$1,750					2720 5-p Brougham	1,640		(124 in. W. B.)		
3550 5-p Sp. Touring	1,800					FORD			3428 2-p Sportster	1,995	
3610 7-p Touring	1,625					Without Starter and Dem. Rims			3428 4-p Foursome	1,795	
3690 7-p Touring Encl.	1,700					1395 2-p Runabout	\$260		3528 7-p Touring	1,795	
3745 3-p Country Club	2,075					1517 5-p Touring	290		3645 4-p Coupe	2,400	
3905 5-p Brougham Sedan	2,350					With Starter and Dem. Rims			3875 7-p Sedan	2,625	
4030 7-p Limousine	2,525					1540 2-p Runabout	345		3400 7-p Road King Sedan	1,795	
3995 7-p Sedan	2,425					1662 5-p Touring	375		----- 5-p Sedanette	2,395	
3850 7-p Town Car	2,925					1772 2-p Coupe	520		KISSEL		
CADILLAC "V-63"						1950 5-p Sedan, Fordor	660		2980 5-p Phaeton Std.	\$1,685	
4190 4-p Roadster	\$3,185					1898 5-p Sedan, Tudor	580		3170 5-p Phaeton DeLuxe	1,885	
4280 7-p Touring	3,185					FRANKLIN "10 C"			3190 5-p Tourster	2,085	
4200 4-p Phaeton	3,185					2835 4-p Coupe	\$1,950		3130 2-p Speedster	2,185	
----- 5-p Coach	3,185					2860 5-p Sedan	2,750		3530 2-p Enc. Speedster	2,785	
4610 7-p Sedan	3,585					2770 5-p Demi-Sedan	2,250		3430 4-p Coupe	2,585	
4380 4-p Victoria	3,275					2880 5-p Brougham	2,850		3530 5-p Brougham	2,685	
4475 5-p Landau	3,650					----- 5-p Touring Lim.	2,950		3530 5-p Sedan	2,385	
"Custom Built"						GARDNER "Series 5"			3530 5-p Victoria	2,685	
(132 in.)						2520 3-p Roadster	\$945		4070 7-p Sedan	3,385	
4260 2-p Coupe	3,975					2545 3-p Spec. Roadster	1,045		4010 7-p Berline Sedan	3,485	
4400 5-p Coupe	4,350					2550 3-p Radio Roadster	1,135		LEXINGTON		
4490 5-p Sedan	4,550					2555 5-p Touring	995		----- 5-p "Concord"		
4590 7-p Suburban	4,650					2610 5-p Special Touring	1,095		----- 5-p Touring (Enc.)	\$1,595	
4655 7-p Imp. Suburban	4,950					2650 5-p Touring DeLuxe	1,145		----- 5-p Spec. Touring	1,795	
CASE J. I. C.						2590 5-p Touring "A"	1,045		----- 5-p Sedan	2,185	
3260 3-p Roadster	\$1,840					2750 5-p Radio Touring	1,145		----- 2-p Roadster	2,145	
3290 5-p Touring	1,885					2850 5-p Coupe	1,275		----- 5-p Touring	2,095	
3470 5-p Sp. Touring	2,160					2860 5-p Sedan	1,475		----- 5-p Lark Touring	2,345	
3570 4-p Sub. Coupe	2,480					2895 5-p Sedan	1,475		----- 5-p Cal. Touring	2,495	
3640 5-p Sedan	2,690					3070 5-p Sp. Sedan	1,595		----- 7-p Cal. Touring	2,495	
----- 5-p Brougham	2,690					----- 5-p Touring	1,995		----- 7-p Touring	2,195	
						----- 5-p Brougham	1,995		----- 5-p Royal Coach	2,495	
									----- 5-p Brougham	2,595	
									----- 5-p Sedan	2,895	

Prices and Weights of Current Passenger Car Models

Ship.	Wt.	Pass.	Body Style	Price	Ship.	Wt.	Pass.	Body Style	Price	Ship.	Wt.	Pass.	Body Style	Price	Ship.	Wt.	Pass.	Body Style	Price
LINCOLN					OLDSMOBILE					RICKENBACKER					Special Six				
4050	2-p		Roadster	\$4,000	2145	2-p		Roadster	\$875	2815	3-p		Sp. Roadster	\$1,645	3065	3-p		Du. Roadster	\$1,450
4290	7-p		Touring	4,000	2270	2-p		Sp. Roadster	985	2880	5-p		Sp. Touring	1,395	3475	5-p		Du. Phaeton	1,495
4215	4-p		Phaeton	4,000	2200	5-p		Touring	875	3050	4-p		Coupe	1,895	3675	4-p		Victoria	2,050
4380	5-p		Coupe	4,600	2360	5-p		Sp. Touring	1,015	-----	5-p		Coach Brough	1,595	3855	5-p		Sedan	2,150
4375	4-p		Sedan	4,800	2330	2-p		Bus. Coupe	1,045	3160	5-p		Sedan	1,995	2780	5-p		Berline	2,225
4600	5-p		Sedan	4,900	2460	4-p		Coupe	1,175	"A"					Big Six				
4660	7-p		Sedan	5,100	2410	5-p		Coach	1,065	3326	4-p		Sport Phaeton	2,195	3785	7-p		Du. Phaeton	1,875
4720	7-p		Limousine	5,300	2570	5-p		Sedan	1,250	8440	4-p		Coupe	2,695	4030	5-p		Coupe	2,650
LOCOMOBILE					2740	5-p		DeLuxe Sedan	1,350	3585	5-p		Sedan	2,795	4150	7-p		Sedan	2,785
"48"					OVERLAND					-----	5-p		Coach Brough	2,395	4200	7-p		Berline	2,860
5080	4-p		Sportif Tour.	\$7,400	"91" (100 in. wheelbase)					ROAMER					STUTZ				
5330	7-p		Touring	7,400	1769	2-p		Roadster	\$530	"6-54-E" (118 in. W. B.)					"693-4"				
5600	5-p		Victoria Sedan	9,900	1863	5-p		Touring	530	3100	2-p		Roadster	\$2,685	3250	3-p		Roadster	\$2,880
5644	7-p		Brougham	9,990	1918	5-p		Touring DeLuxe	595	3106	4-p		Tourer	2,485	3350	5-p		Touring	2,880
5640	7-p		Tour. Limousine	9,000	2177	2-p		Coupe	695	3300	4-p		Sp. Touring	2,750	-----	5-p		Tourabout	3,000
5868	7-p		Encl. Drive Lim.	9,990	2130	5-p		Sedan	850	-----	7-p		Touring	2,685	-----	4-p		Coupe	3,580
5624	7-p		Cabriolet	10,250	2004	5-p		Coupe Sedan	585	-----	3-p		Cabriolet	3,285	3750	5-p		Sedan	3,580
McFARLAN					"92" (106 in. W. B.)					"6-54-E" (138 in. W. B.)					"695"				
"6" TV					2044	5-p		Blue Bird	725	4100	5-p		Spec. Sedan	4,250	3900	5-p		Sportster	\$3,535
4600	2-p		Roadster	\$5,400	PACKARD					4200	7-p		Suburban-Sedan	3,950	3950	7-p		Touring	3,570
4600	4-p		Sport Touring	5,600	"6" (126 in. W. B.)					3650	4-p		"4-75-E"	3,650	4150	5-p		Sportbrough	4,435
4700	7-p		Touring	5,700	3165	4-p		Roadster	\$2,785	"4-85-E"					4350	7-p		Suburban	4,535
4900	7-p		Coupe	6,720	3320	5-p		Touring	2,585	3200	2-p		Spec. Speedster	3,785	4450	7-p		Berline	4,785
5200	5-p		Tour. Sedan	6,720	3255	4-p		Sp. Touring	2,750	ROLLIN					TEMPLAR				
5200	7-p		Tour. Sedan	6,810	3400	4-p		Coupe	3,275	2300	5-p		Touring	\$1,155	3300	4-p		Suburban Tour.	\$2,175
5200	7-p		Sub. Sedan	6,600	3515	5-p		Coupe	3,450	2315	3-p		Coupe Roadster	1,325	3300	5-p		Phaeton	1,985
5200	7-p		Sub. Sedan	7,000	3565	5-p		Sedan	3,375	2425	3-p		Spec. Coupe	1,395	-----	5-p		Sedan	2,785
5100	7-p		Limousine	6,900	3610	5-p		Sedan Limousine	3,425	2485	5-p		Sedan	1,455	-----	4-p		Brougham	2,650
5200	7-p		Town Car	9,000	"6" (133 in. W. B.)					2595	5-p		Spec. Sedan	1,550	VELIE				
"Light 6" SV					3430	7-p		Touring	2,785	ROLLS ROYCE					"60"				
3700	3-p		Roadster	2,600	3690	7-p		Sedan	3,625	Chassis					2840	5-p		Touring	\$1,250
3700	5-p		Touring	2,600	3765	7-p		Sedan Limousine	3,675	††Manufacturers do not quote list prices.					3025	5-p		Club Phaeton	1,425
3850	4-p		Coupe	3,100	"8" (136 in. W. B.)					STANLEY					3340	5-p		Royal Sedan	1,925
3850	5-p		Sedan	3,100	3880	4-p		Runabout	3,850	"252"					3100	5-p		Sedan	1,675
3900	7-p		Sedan	3,200	3990	5-p		Touring	3,650	3770	5-p		Phaeton	\$2,500	3083	5-p		Coach Sedan	1,425
MARMON					3930	4-p		Sp. Touring	3,800	3910	7-p		Phaeton	2,750	WESTCOTT				
3470	2-p		Roadster	\$3,165	4125	4-p		Coupe	4,550	4075	5-p		Sedan	3,300	"44"				
3575	5-p		Phaeton	3,165	4200	5-p		Coupe	4,725	4170	7-p		Sedan	3,985	3050	5-p		Touring	\$1,690
3690	7-p		Touring	3,165	4270	5-p		Sedan	4,650	STAR					3150	5-p		Spec. Touring	1,840
3770	5-p		Brougham Coupe	3,295	4275	5-p		Sedan Limousine	4,700	1700	2-p		Roadster	\$540	3300	4-p		Brougham 3 d.	2,290
-----	3-p		Coupe de Luxe	3,455	"8" (143 in. W. B.)					1790	5-p		Touring	540	"48"				
8970	5-p		Sedan	3,295	4020	7-p		Touring	3,850	1800	5-p		Touring FWB	745	3550	7-p		Touring	1,990
-----	5-p		Sedan de Luxe	3,775	4275	7-p		Sedan	4,900	1880	5-p		Spec. Touring	795	3650	7-p		Spec. Touring	2,190
4155	7-p		Sedan de Luxe	3,850	4350	7-p		Sedan-Limousine	4,950	1980	2-p		Coupe	750	"60"				
4000	5-p		Sedan Limousine	3,900	PAIGE					2115	5-p		Sedan	820	WILLS SAINTE CLAIRE				
4100	7-p		Sedan Limousine	3,975	3677	4-p		Phaeton	\$2,165	2150	5-p		Spec. Sedan	1,090	"A-68" (121 in. W. B.)				
MAXWELL					3742	7-p		Phaeton	2,165	STEARNS-KNIGHT					"B" (4)				
2135	2-p		Roadster	\$585	3880	4-p		Phaeton DeLuxe	2,095	-----	4-p		Coupe Roadster	\$1,795	3240	3-p		Roadster	\$2,575
2210	5-p		Touring	895	3900	5-p		Brougham 4 d.	2,395	3775	5-p		Touring	1,595	3320	5-p		Touring	2,475
2410	5-p		Sp. Touring	1,055	4285	7-p		Sedan DeLuxe	2,770	4250	5-p		Sedan	2,095	3460	4-p		Coupe	3,275
2255	2-p		Club Coupe	1,025	4300	7-p		Sub. Limousine	2,895	3750	4-p		Coupe Brougham	1,895	3630	7-p		Sedan	3,475
2440	5-p		Club Sedan	1,095	PEERLESS					-----	5-p		Brougham	2,095	3670	5-p		Imperial Sedan	3,575
2595	5-p		Sedan	1,345	"6-70"					-----	5-p		Coupe	2,095	3500	5-p		Brougham	3,375
2785	5-p		Trav. Sedan	1,585	3050	2-p		Roadster	\$2,350	"S" (6)					3650	5-p		Limousine	3,850
MOON					3175	5-p		Touring	2,285	-----	2-p		Roadster	2,495	3600	5-p		Town Car	3,850
Series "A"					3525	7-p		Touring	2,485	3775	5-p		Touring	2,495	"B-68" (127 in. W. B.)				
2440	4-p		Roadster	\$1,295	3700	5-p		Coupe	2,950	3850	7-p		Touring	2,495	3265	4-p		Roadster	2,875
2460	5-p		Sp. Touring	1,195	3550	5-p		Sedan	2,995	4025	2-p		Coupe	3,395	3335	5-p		Traveler	2,975
2605	5-p		Sedan 2 d	1,495	3900	7-p		Sedan	3,295	4275	4-p		Sp. Coupe	3,150	3500	7-p		Phaeton	2,875
2755	5-p		Petite Sedan 4d	1,785	Equipoised "8"					-----	5-p		Sedan	2,945	3495	4-p		Coupe	3,675
Newport					4300	4-p		Tour. Phaeton	3,285	4275	7-p		Sp. Sedan	3,395	3625	5-p		Sedan	3,775
2760	5-p		Touring	1,495	4355	7-p		Sub. Sedan	4,450	-----	4-p		Touring	1,875	3635	7-p		Sedan	3,500
2920	5-p		Sedan	1,815	4430	7-p		Berline Lim.	4,725	-----	5-p		Touring	1,875	3870	5-p		Brougham 4-D	3,800
3090	5-p		Petite Sedan	1,915	4130	4-p		Victoria Coupe	3,950	-----	5-p		Coupe Brougham	2,285	3710	7-p		Limousine	3,990
Metropolitan					-----	5-p		Coupe	4,175	PIERCE-ARROW					"64"				
2860	5-p		Touring	1,515	"33"					4200	2-p		Roadster	\$8,150	WILLYS-KNIGHT				
8120	5-p		Sedan	1,995	4350	2-p		Runabout	\$5,250	4400	7-p		Touring	7,500	"44"				
8190	5-p		Sp. Sedan	2,095	4590	5-p		Touring	5,250	4250	4-p		Sp. Touring	7,750	2681	2-p		Roadster	\$1,275
London					4780	3-p		Coupe	6,800	4600	4-p		Coupe	9,000	2768	5-p		Touring	1,295
3270	5-p		Sp. Touring	1,985	4830	4-p		Sedan	6,900	4800	4-p		Sedan	10,000	3062	3-p		Coupe	1,770
3590	5-p		Petite Sedan	2,540	4960	7-p		Sedan	7,000	4800	6-p		Sedan	9,675	3115	5-p		Sedan	1,795
NASH					4750	4-p		Coupe Sedan	6,900	4800	6-p		Town Brougham	10,175	3111	4-p		Coupe Sedan	1,550

Current Passenger Car Specifications

(This list comprises cars distributed on a national basis)

MAKE AND MODEL	Wheelbase (Ins.)	TIRES		ENGINE										Electrical System		Clutch	Gear-set	Universal Joints	REAR AXLE		BRAKES				Steering Gear	Rear Spring
		Standard Size (Ins.)	Ballon Equipment	Make	Model	Number of Cylinders, Bore and Stroke (Ins.)	Rated Horsepower, N.A.A.C.	Valve Arrangement	Piston Material	Number of Main Crankshaft Bearings	Oiling System	Carburetor Make	Ignition System Make	Generator and Starter Make	Type and Make				Make	Type and Make	Gear Ratio	Foot, Type and Location	Hand, Type and Location	Four-Wheel Brake, Type		
Ambassador.....D-1	114	31x4	Yes	Cont	7U	6-31/2x4 1/4	23.44	L	C	3	Sp	Zen	Del	Del	D-Lon	Opt	Spi	1/2 Tim	4.90	E-R	E-T	None	Ros	S-56		
American.....D-66	127	33x4 1/2	No	H-Sp	91	6-31/2x5	29.40	L	C	3	PS	Str	Del	Del	P-B&B	War	M-Har	1/2 Sal	5.10	E-R	E-R	None	Jav	S-57 1/2		
Anderson.....41	115	31x5.2	Yes	Cont	7U	6-31/2x4 1/4	23.44	L	C	3	PC	Zen	Wes	Wes	P-B&B	Dur	F-Uni	1/2 Sal	4.75	E-R	E-T	Mec*	Gem	S-58		
Anderson.....50	122	33x4.9	Yes	Cont	8R	6-31/2x4 1/4	27.34	L	C	4	PC	Zen	Rem	Rem	P-B&B	Dur	F-Uni	1/2 Sal	4.50	E-R	E-T	Mec*	Gem	S-58		
Apperson.....6	120	32x5.7	Yes	Own	6	6-31/2x4 1/4	21.40	L	C	4	PC	Str	Rem	Rem	P-Roc	Mec	M-Stl	1/2 Col	5.10	E-R	I-R	Mec*	Jav	J-48		
Apperson.....8	130	33x6.7	Yes	Own	8	8-31/2x5	33.80	L	C	4	PC	Str	Rem	Rem	D-Own	Own	M-Thi	1/2 Own	5.10	E-R	I-R	Mec*	Jav	J-48		
Auburn.....6-43	114	31x4	Yes*	Cont	7U	6-31/2x4 1/4	23.44	L	C	4	PC	Str	Rem	Rem	P-B&B	W-G	M-Uni	1/2 Col	4.63	E-R	E-T	Mec*	Jac	S-57		
Auburn.....8-63	124	32x6.2	Yes	Lyc	H	8-31/2x4 1/4	31.25	L	C	5	PC	Str	Del	Del	P-B&B	W-G	M-Uni	1/2 Col	4.63	E-R	E-T	Mec*	Jac	S-57		
Barley.....6-50	118	32x4	No	Cont	7U	6-31/2x4 1/4	23.44	L	C	4	PC	Str	Del	Del	P-B&B	Ful	R-M&E	1/2 Col	5.11	E-R	I-R	None	Jac	S-58		
Buick....."Standard"	114 1/2	31x4.9	Yes	Own	Sta	6-31/2x4 1/4	21.60	L	C	4	FP	Mar	Del	Del	D-Own	Own	M-Own	1/2 Own	4.90	E-F	I-R	Mec	Jac	V-48		
Buick....."Master"	120	32x5.7	Yes	Own	Mast	6-31/2x4 1/4	27.34	L	C	4	FP	Mar	Del	Del	D-Own	Own	M-Own	1/2 Own	4.73	E-F	I-R	Mec	Jac	V-47 1/2		
Cadillac.....V-63	132	33x5	Yes*	Own	63	8-31/2x5 1/2	31.25	L	C	3	PC	Own	Del	Del	D-Own	Own	M-Spi	1/2 Tim	4.50	B-F	I-R	Mec	Own	N-54		
Case.....X	122	32x4 1/2	Yes*	Cont	8R	6-31/2x4 1/4	27.34	L	C	4	PC	Ray	Del	Del	D-Own	Own	R-Sne	1/2 Col	4.90	E-R	I-R	Ilyd*	Jav	S-55 1/2		
Case.....JIC	122	32x4 1/2	Yes*	Cont	8R	6-31/2x4 1/4	27.34	L	C	4	PC	Sch	Del	Del	D-Own	Own	R-Sne	1/2 Col	4.90	E-R	I-R	Ilyd	Jav	S-55		
Case.....Y	123	33x5	Yes*	Cont	6T	6-31/2x5	33.75	L	C	4	PC	Sch	Del	Del	D-Own	Own	R-Sne	1/2 Col	4.45	E-F	I-R	Ilyd	Own	S-57		
Chandler.....SS	123	33x6.0	Yes	Own	6	6-31/2x5	29.40	L	C	4	PC	Sch	Bos	Bos	P-B&B	W-G	R-Own	1/2 Own	4.45	E-F	E-T	Mec	Own	S-58 1/2		
Chevrolet.....Superior	103	30x3 1/2	No	Own	Sup	4-31/2x4	21.76	L	C	3	PS	Zen	Rem	Rem	K-Own	Own	M-Own	1/2 Own	3.77	E-R	I-R	None	Own	C-28		
Chrysler.....Six	112 1/2	30x5.7	Yes	Own	Six	6-31/2x4 1/4	21.60	L	A	7	FP	Bal	Rem	Rem	D-Own	Own	M-Own	1/2 Own	4.60	E-F	E-T	Hyd	Jac	S-53		
Cleveland.....43	118 1/2	31x5.2	Yes	Own	43	6-31/2x4 1/4	23.44	L	C	3	PC	Sch	Bos	Bos	P-B&B	Own	R-Sne	1/2 Own	4.90	E-R	E-T	Mec*	CAS	S-53		
Cole.....Master	127	31x7.3	Yes	Own	311	8-31/2x4 1/4	39.20	L	C	3	PC	Sch	Del	Del	D-Own	Own	M-Spi	1/2 Col	4.10	E-R	I-R	None	Own	S-57		
Crawford.....6-70	138	33x4 1/2	No	Cont	6T	6-31/2x5	31.54	L	C	4	PC	Zen	Wes	Wes	D-B-L	Own	M-Spi	1/2 Tim	5.00	E-R	I-R	None	Own	J-42		
Cunningham.....V4	132	33x5	Yes*	Own	V4	8-31/2x5	45.00	L	C	3	FP	Str	Del	Del	D-Own	Own	M-Spi	1/2 Tim	4.23	E-R	I-R	None	Own	J-42		
Dagmar.....6-60	118	32x4 1/2	Yes*	Cont	8R	6-31/2x4 1/4	27.34	L	C	4	PC	Sch	Del	Del	D-B&B	War	M-Spi	1/2 Tim	5.10	E-R	E-T	None	Gem	S-52		
Dagmar.....6-70	138	33x5	Yes*	Cont	8R	6-31/2x5	33.75	L	C	4	PC	Sch	Del	Del	D-B-L	War	M-Spi	1/2 Tim	4.90	E-R	E-T	None	Gem	S-52		
Daniels.....24-38	135	33x5	Yes*	Own	24-38	8-31/2x5 1/2	39.20	L	C	3	PC	Zen	Del	Del	P-Own	Own	M-Spi	1/2 Tim	4.23	E-R	I-R	None	Ros	S-52		
Davis.....90	115	31x4	Yes*	Cont	7U	6-31/2x4 1/4	23.44	L	C	3	PC	Str	Del	Del	P-B&B	W-G	M-Pet	1/2 Tim	5.10	E-F	I-R	Hyd	Own	S-52		
Davis.....91	118	32x4 1/2	Yes*	Cont	8R	6-31/2x4 1/4	27.34	L	C	4	PC	Str	Del	Del	P-B&B	W-G	M-Pet	1/2 Tim	5.10	E-F	I-R	Hyd	Own	S-52		
Dodge Brothers.....	116	30x5.7	Yes	Own	4	4-31/2x4	21.03	L	A	3	PS	Ste	N.E.	N.E.	D-Own	Own	M-Own	1/2 Own	4.54	E-R	I-R	None	Own	S-55		
Dorris.....	132	32x6.2	Yes	Own	6-80	6-4x5	38.40	L	C	7	PC	Str	Bos	Bos	D-Own	Own	M-Spi	1/2 Tim	3.77	E-R	I-R	None	Own	S-50		
Duesenberg Straight.....	131	33x5	Yes*	Own	8	8-27/8x5	26.45	L	A	3	PC	Str	Del	Del	P-Own	Own	R-Cl	1/2 Own	4.90	I-F	E-T	Hyd	Own	S-59		
Dupont.....D	121	32x6.2	Yes	Wis	Y	6-31/2x5	27.34	L	A	3	FP	Sch	Bos	Bos	D-Lon	Cpl	M-Uni	1/2 Eat	4.45	E-R	I-R	None	Jac	S-50 1/2		
Durant.....A-22	109	31x4	Yes*	Cont	Spec	4-31/2x4 1/4	24.03	L	A	3	PC	Til	A-L	A-L	P-Own	War	M-Spi	1/2 Ad	4.33	E-R	I-R	None	Own	S-50 1/2		
Elcar.....4-41	112	31x4	Yes*	Lyc	CF	4-31/2x5	21.03	L	A	5	PC	Zen	A-L	A-L	P-B&B	W-G	M-Mec	1/2 Sal	4.70	E-R	E-T	Mec*	Ros	S-51		
Elcar.....6-51	112	31x4	Yes*	Cont	7U	6-31/2x4 1/4	23.44	L	C	4	PC	Zen	A-L	A-L	P-B&B	W-G	M-Mec	1/2 Sal	4.70	E-R	E-T	Mec*	Ros	S-51		
Elcar.....6-61	118	32x4	Yes*	Cont	8R	6-31/2x4 1/4	27.34	L	C	4	PC	Str	Del	Del	P-B&B	W-G	M-Har	1/2 Sal	4.70	E-R	E-T	Mec*	Ros	S-52		
Elcar.....8-80	127	32x6.2	Yes	Lyc	H	8-31/2x4 1/4	31.25	L	C	5	PS	Ste	Del	Del	P-B&B	W-G	M-Spi	1/2 Own	4.71	E-F	E-T	Hyd	Own	S-58		
Essex.....6	116 1/2	31x5.2	Yes	Own	6	6-31/2x4 1/4	17.32	L	A	3	Sp	Ste	Bos	Bos	D-Own	Own	M-Spi	1/2 Own	5.60	E-R	I-R	None	Own	S-51 1/2		
Flint.....40	115	30x5.2	Yes	Cont	6-W	6-31/2x4 1/4	23.44	L	C	4	PC	Til	A-L	A-L	P-Own	War	M-Spi	1/2 Ad	4.77	E-F	E-T	Hyd	War	S-50		
Flint.....55	120	32x6.2	Yes	Cont	55	6-31/2x5	27.34	L	C	3	PC	Str	Del	Del	P-Own	War	M-Spi	1/2 Ad	4.77	E-F	E-T	Hyd	War	S-50		
Ford.....T	100	30x3 1/2	No	Own	T	4-31/2x4	22.50	L	C	3	Sp	Str	Del	Del	D-Own	Own	M-Own	1/2 Own	3.63	E-T	I-R	None	Own	O-40 1/2		
Franklin.....10 C	115	32x4.9	Yes	Own	10-C	6-31/2x4	25.35	L	A	7	PC	Str	A-K	A-K	P-M&E	Own	M-Spi	1/2 Own	4.73	E-T	E-R	None	Own	E-38		
Gardner.....Series 5	112	32x4	Yes*	Lyc	CE	4-31/2x5	21.76	L	A	5	PC	Zen	Wes	Wes	P-B&B	Mec	M-Pet	1/4 Fli	4.80	I-R	I-R	None	Ros	S-51		
Gardner....."8"	123	30x5.7	Yes*	Lyc	CE	6-31/2x4 1/4	29.20	L	C	3	Sp	Sch	Wes	Wes	P-B&B	Mec	M-Pet	1/4 Col	4.60	I-F	E-T	Hyd	Own	S-51		
Gray.....0	104	30x3 1/2	Yes*	Own	0	4-31/2x4	21.03	L	C	3	Sp	Sch	Wes	Wes	P-Own	Det	R-Sne	1/2 Tim	3.90	I-R	E-T	None	Own	Q-30		
H.C.S.....Series 6	126	32x5	Yes*	Own	6	6-31/2x5	29.40	L	C	3	FP	Str	Del	Del	D-B-L	B-L	M-Spi	1/4 Own	4.63	I-R	I-R	None	Gem	S-56		
Hatfield.....6-55	121	32x4	No	H-Sp	40	6-31/2x5	25.35	L	C	3	PS	Str	Bos	Bos	P-B&B	Dur	M-Spi	1/2 Col	4.63	E-R	I-R	None	Gem	S-56 1/2		
Haynes.....60	121	33x5.7	Yes	Own	60	6-31/2x4 1/4	29.40	L	C	3	PS	Ray	Kin	L-N	D-Own	Mec	M-Thi	1/2 Own	4.41	E-R	E-T	None	Jac	S-54 1/2		
Hudson.....Super 6	127	33x6.2	Yes	Own	6	6-31/2x5	29.40	L	A	4	Sp	Ste	Bos	Bos	D-Own	Own	M-Spi	1/2 Own	4.45	E-R	I-R	None	Gem	S-56		
Hupmobile.....Series R	115	31x5.2	Yes	Own	R	4-31/2x4 1/4	16.90	L	C	3	Sp	Ste	Wes	Wes	D-Own	Own	M-Uni	1/2 Own	4.87	E-R	I-R	None	Ros	S-56 1/2		
Hupmobile.....E-1	118 1/2	33x6.0	Yes	Own	E	8-27/8x4 1/4	26.45	L	C	5	PC	Str	A-K	Wes	D-Lon	Det	M-Uni	1/2 Own	4.63	E-R	E-T	Hyd	Ros	S-56 1/2		
Jewett.....23-25	112	31x5.2	Yes</																							



When Every Motorist Had to Carry Matches

Changes are made almost overnight in the fast-stepping motor car industry.

A dozen years ago if the motorist lacked matches when darkness came on, he could not light his acetylene lamps. Sometimes, on a wind-swept road, even the motorist with matches had to find his way in the dark.

After you turned on and regulated the gas, using a wrench—heaven help you if you lost it!—you sped away, hoping your gas supply would not fail as you were driving along some particularly dark and dangerous road.

You had to change your acetylene tank every two weeks or so—or, if you used a generating tank, you had to clean it out and refill. And, oh yes, it would freeze up in winter, of course.

Well, that day is gone forever—and it went quickly. It disappeared as quickly as the hand crank.

It disappeared as rapidly as two-wheel brakes are disappearing today. Soon all cars will be four-wheel brake equipped.

Because of the complications of mechanical four-wheel brakes, all the industry will come to the simplest, most effective four-wheel brake system—Lockheed Hydraulic.

In fact, 32 out of the 44 cars now equipped with four-wheel brakes, use Lockheed Hydraulic Four-Wheel Brakes.

You may expect additional cars to announce Lockheed Hydraulics as standard equipment, from time to time.

HYDRAULIC BRAKE COMPANY

5835 Russell Street

Detroit, Michigan

The Answer
LOCKHEED
Four Wheel Brakes
HYDRAULIC

Current Passenger Car Specifications

(This list comprises cars distributed on a national basis)

MAKE AND MODEL	Wheelbase (Ins.)	TIRES		ENGINE										Electrical System		Clutch	Gear-set	Universal Joints	REAR AXLE		BRAKES				Steering Gear	Rear Springs
		Standard Size (Ins.)†	Balloon Equipment	Make	Model	Number of Cylinders, Bore and Stroke (Ins.)	Rated Horsepower, N.A.C.C.	Valve Arrangement	Piston Material	Number of Main Crankshaft Bearings	Oiling System	Carburetor Make	Ignition System Make	Generator and Starter Make	Type and Make				Make	Type and Make	Type and Make	Gear Ratio†	Foot, Type and Location	Hand, Type and Location		
Paige.....21-24	131	33x6.7	Yes	Cont	10A	6-3 1/4 x 5	33.75	L	C	4	PC	Ray	A-K	Rem	D-Lon	W-G	M-Mec	1 1/2 Tim	4.90	E-R	E-T	Hyd*	Gem	S-61 1/2		
Peerless.....70	126	33x6.2	Yes	Own	70	6-3 1/2 x 5	29.40	L	C	7	PC	Joh	Del	Del	D-Own	Own	M-Spi	1 1/2 Tim	4.66	E-F	I-R	Hyd	Gem	S-54		
Peerless, Equipped "8"	128	33x6.6	Yes	Own	66	8-3 1/4 x 5	33.80	L	C	3	PC	Str	Del	Del	D-Own	Own	M-Spi	1 1/2 Tim	4.90	E-R	I-R	Hyd	Gem	S-60		
Pierce-Arrow.....33	138	33x5	No	Own	33	6-4 x 5 1/2	38.10	T	C	7	FP	Own	Del	Del	D-Own	Own	M-Spi	1 1/2 Tim	4.29	E-R	I-R	Mec*	Own	S-		
Pierce-Arrow....."80"	130	32x5.7	Yes	Own	"80"	6-3 1/2 x 5	29.40	L	C	7	PC	Own	Del	Del	P-B&B	B-L	M-Spi	1 1/2 Tim	4.45	I-F	I-R	Mec	Gem	S-56 1/2		
Reo.....T6	120	32x6.2	Yes	Own	T6	6-3 1/4 x 5	24.31	G	A	4	PS	Sch	NE	NE	D-Own	Own	M-Own	1 1/2 Own	4.70	E-R	I-R	None	Own	S-54 1/2		
Revere.....25	131	32x6.2	Yes	Cont	6-J	6-3 3/4 x 5	33.75	H	C	4	PC	Sch	Bos	Wes	D-Ful	Ful	M-Spi	3/4 Col	3.75	I-F	E-T	Mec	Gem	S-56 1/2		
Rickenbacker.....C	117	31x5.2	Yes*	Own	C	6-3 1/4 x 4 1/4	23.44	L	C	3	PC	Str	Bos	Bos	D-Own	W-G	M-Mec	1 1/2 Own	4.63	I-F	E-T	Mec	Gem	S-57		
Rickenbacker.....A	121 1/2	33x4 1/2	Yes*	Own	A	8-3 x 4 1/4	28.60	L	C	9	PC	Zen	Del	Bos	D-Own	W-G	M-Mec	1 1/2 Own	5.10	I-F	E-T	Mec	Gem	S-59		
Roamer.....6-54-E	118	32x4 1/2	No	Cont	12XD	6-3 1/2 x 5 1/4	29.40	L	A	3	PS	Str	Spl	Wes	P-B&B	Ful	R-M&E	3/4 Tim	4.60	E-R	I-R	Mec*	Jac	V-55 1/4		
Roamer.....4-75-E	128	32x4 1/2	No	Dues	G1	4-1 1/4 x 6	28.90	H	A	3	FP	Str	Bos	Wes	D-B-L	B-L	R-M&E	3/4 Tim	4.63	E-R	I-R	Mec*	Jac	V-55 1/4		
Rollin.....G	112	31x5.2	Yes	Own	G	4-3 1/4 x 4 1/4	16.90	L	A	4	FP	Til	Con	Dyn	P-B&B	Mun	R-Sne	1 1/2 Sal	5.10	I-F	I-F	Mec	Ros	O-46		
Rolls-Royce.....40-50	143 1/2	33x5	No	Own	40	6-4 1/2 x 4 1/4	48.60	L	A	7	FP	Own	Con	"O"	K-Own	Own	M-Own	F Own	3.72	I-R	I-R	None	Own	S-54 1/2		
Stanley.....252	122	31x4.9	Yes	Own	252	2-4 x 5	13.00	X	A	2	Sp	Non	Non	Bos	Non	Non	R-The	1 1/2 Own	4.50	E-F	I-R	Mec	Ros	S-58		
Star.....4	102	30x3 1/2	Yes*	Cont	Spec	1-3 3/8 x 4 1/4	18.23	L	A	3	PK	Til	A-L	A-L	P-Own	War	M-Spi	3/4 Ad	4.87	E-R	I-R	Mec*	War	S-49 1/2		
Stearns Knight.....C	121	32x4 1/2	Yes	Own	K 1	6-3 1/4 x 5	25.35	X	C	4	PC	Joh	DeJ	DeJ	D-M&E	Own	R-Cl	1 1/2 Own	5.30	E-R	I-R	Hyd*	Eat	V-50		
Stearns Knight.....B	119	33x4 1/2	Yes*	Own	Kni	4-3 3/8 x 5 1/8	22.50	X	C	3	PC	Sch	A-K	A-L	D-Own	Own	R-Cl	1 1/2 Own	4.50	E-R	I-R	Hyd*	Own	V-50		
Stearns Knight.....S	130	33x6.0	Yes	Own	Kni	6-3 1/2 x 5	29.40	X	C	4	PC	Joh	DeJ	DeJ	D-M&E	Own	R-Cl	1 1/2 Own	4.90	E-R	I-R	Hyd	Sta	V-50		
Sterling Knight.....	125	32x4 1/2	Yes*	Own	Kni	6-3 1/4 x 4 1/8	25.35	X	C	7	FP	Str	Wes	Bos	D-Ful	Ful	R-Cl	1 1/2 Tim	4.66	E-R	I-R	Mec*	Ros	S-58		
Stevens-Duryea.....G	138	33x5	No	Own	G	6-4 1/8 x 5 1/2	47.25	L	C	4	PS	Str	Bos	Bos	D-B-L	B-L	M-Spi	F Tim	3.76	E-R	I-R	None	Ros	S-57 1/2		
Studebaker.....Sta. Six	113	31x5.2	Yes	Own	ER	6-3 3/8 x 4 1/4	27.34	L	C	4	PC	Str	(Wag Rem)	(Wag Rem)	P-Own	Own	R-The	1 1/2 Own	4.18	E-R	E-T†	Hyd*	Own	S-50 1/2		
Studebaker.....Spec. Six	120	32x6.2	Yes	Own	EQ	6-3 1/2 x 5	29.40	L	C	4	PC	Str	(Wag Rem)	(Wag Rem)	P-Own	Own	M-Spi	1 1/2 Own	4.36	E-R	E-T	Hyd*	Own	S-56		
Studebaker.....Big Six	127	34x7.3	Yes	Own	EP	6-3 3/8 x 5	36.01	L	C	4	PC	Bal	(Wag Rem)	(Wag Rem)	P-Own	Own	M-Spi	1 1/2 Own	3.69	E-R	E-T	Hyd*	Own	S-56		
Stutz.....693-A	120	32x4 1/2	Yes*	Own	691	6-3 1/2 x 5	29.40	I	C	3	PC	Str	Rem	Rem	P-B&B	W-G	M-Mec	1 1/2 Tim	5.10	E-R	I-R	None	Gem	S-61 1/2		
Stutz.....695	130	32x4 1/2	Yes*	Own	691	6-3 1/2 x 5	29.40	I	C	3	PC	Str	Rem	Rem	P-B&B	W-G	M-Mec	1 1/2 Tim	4.90	E-R	I-R	Hyd*	Gem	S-61 1/2		
Templar.....	122	33x4	No	Own	50	6-3 3/8 x 5	27.34	L	C	4	PS	Til	Dyn	Dyn	P-M&E	W-G	R-Sne	3/4 Sal	5.10	I-F	E-T	Mec	Ros	S-54		
Vellie.....60	118	31x5.2	Yes	Own	50	6-3 1/8 x 4 1/4	24.38	L	C	3	FP	Str	Wes	Wes	P-B&B	Mun	M-Thi	1 1/2 Own	5.10	E-F	E-T	Hyd	Ros	S-55		
Westcott.....48	125	32x4 1/2	Yes*	Cont	12X	6-3 1/2 x 5 1/8	29.40	L	A	3	PS	Ray	Del	Del	P-B&B	B-L	M-Pet	1 1/2 Tim	4.45	E-R	I-R	Mec*	Gem	S-59		
Westcott.....44	120	32x4 1/2	Yes*	Cont	8R	6-3 3/8 x 4 1/2	27.34	L	C	4	PC	Str	Del	Del	P-B&B	W-G	M-Pet	1 1/2 Col	4.90	E-R	E-T	Mec*	Gem	S-57 1/2		
Westcott.....60	118	32x4	Yes*	Cont	8R	6-3 3/8 x 4 1/2	27.34	L	C	4	PC	Str	Del	Del	P-M&E	W-G	M-Pet	1 1/2 Col	4.63	E-R	E-T	Mec*	Gem	S-56		
Wills Ste. Claire, A&B68	121	32x4 1/2	Yes*	Own	A68	8-3 1/4 x 4	33.80	I	C	3	FP	(Zen Sch)	Del	Del	P-Own	Own	M-Spi	1 1/2 Eat	4.45	(E-F)	(I-R)	(None)	Own	(S-54 1/2)		
Willys Knight.....64&7	118	33x4.9	Yes	Own	64	4-3 3/8 x 4 1/4	21.03	X	C	3	PS	Til	A-L	A-L	D-Own	Own	R-Own	3/4 Own	(4.44)	E-R	I-R	Hyd	None	Own	(S-54 1/2)	
	124	33x5.7																	5.12							

TAXICABS

Checker.....	117	33x4 1/2	No	Buda	WTU	4-3 3/4 x 5 1/8	22.50	L	C	3	PC	Zen	Sci	Wes	D-Ful	Ful	Blo	3/4 Col	4.87	E-R	I-R	None	Jon	S-57 1/2
Driggs.....	108 1/2	30x3 1/2	No	Own		4-2 3/8 x 4 1/2	11.03	L	C		PS	Zen	Bos	Bos	D-Ful	Ful	Spi	3/4 Own	4.74	E-R	I-R	None	Own	S-
Elcar.....4	112	31x4	Yes*	Lycor	CF	4-3 3/8 x 5	21.03	L	A	5	PC	Zen	A-L	A-L	P-B&B	W-G	M-Mec	1/4 Sal	4.75	E-R	E-T	Mec*	Ros	S-51
Elcar.....6	118	32x4	Yes*	Cont	8R	6-3 3/8 x 4 1/2	27.34	L	C	4	PC	Str	Del	Del	P-B&B	W-G	Spi	3/4 Sal	4.75	E-R	I-R	Mec*	Ros	S-52
H.C.S.....	110	29x4 1/2	No	Wauk		4-x 3 1/2	19.60	L	A	5	PC	Zen	Bos	Bos	P-B&B	W-M	M-Spi	1/4 Own	5.10	E-R	E-T	None	Ros	S-
Kelsey.....E	112	32x4	No	Lycor	CH	4-x 3 1/2	19.60	L	A	5	PC	Zen	Bos	Bos	P-B&B	W-M	M-Spi	1/4 Sal	5.10	E-R	I-R	None	Lav	S-55
Luxor....."Lux"	118	33x4 1/2	No	Buda	WTU	4-3 3/8 x 5 1/8	22.50					Zen	Bos	Bos	D-Ful	Ful	M-Spi	1/2 Col		E-R	E-T	None	Gem	S-56 1/4
Pennant.....	115	33x4 1/2	No	Buda	WTU	4-3 3/8 x 5 1/8	22.50	L	B	3	PC	Zen	Bos	Wes	D-Ful	Ful	Blo	3/4 Col	4.87	E-R	I-R	None	Jon	S-57
Premier.....4A	118	33x4 1/2	No	Buda	WTU	4-3 3/8 x 5 1/8	22.50	L	B	3	PC	Zen	Bos	Bos	D-Ful	Ful	Blo	3/4 Col	4.70	E-R	I-R	None	Ros	S-57 1/2
Rauch & Lang.....T	112	32x4	No	Buda	WTU	4-3 3/8 x 5 1/8	22.50	L	C	3	Sp	Zen	Bos	Dyn†	D-Dtl	Det	Spi	1/2 Sta	5.10	E-R	E-T	None	Gem	S-59 1/2
Rauch & Lang**.....	102	33x4 1/2	No	Own		Electric								None	None	None	Own	Own	8.60			None	None	S-
Reo.....	113	32x4 1/2	Yes*	Own	T-6	6-3 1/8 x 5	24.30	G	A	4	PS	Sch	N-E	N-E	D-Own	Own	Own	1/2 Own	4.70	E-R	I-R	None	Own	S-54
Traveler.....	108 1/2	32x4	No	Buda	WTU	4-3 3/8 x 5 1/8	22.50	L	B	3	PC	Zen	Eis	Eis	D-Dtl	W-M	Spi	Col		E-R	I-R	None	Gem	S-
White.....15A	119	34x4 1/2	No	Own	GK	4-3 3/8 x 5 1/8	22.50	L	C		Sp	Zen	Opt	Opt	P-Own	Own	Own	1/2 Own	5.36	E-R	I-R	None	Own	J-
Willys Knight.....A.B.C.	118	32x4 1/2	Yes*	Own	64	4-3 3/8 x 4 1/2	21.03	X	C	3	PS	Til	A-L	A-L	D-Own	Own	Own	1/2 Own	5.12	E-R	I-R	None	Own	S-55
Yellow.....O-4	109	32x4 1/2	No	Cont	V7	4-3 3/8 x 5	22.50	L	C	3	Sp	Zen	Bos	N-E†	D-B-L	B-L	Spi	3/4 Tim	4.90	E-R	E-T	None	Gem	56
Yellow.....A-2	109	29x4 1/2	Yes	Cont	V7	4-3 3/8 x 5	22.50	L	C	3	Sp	Zen	Bos	N-E†	D-B-L	B-L	Spi	3/4 Tim	4.90	E-R	E-T	None	Gem	56

ABBREVIATIONS—

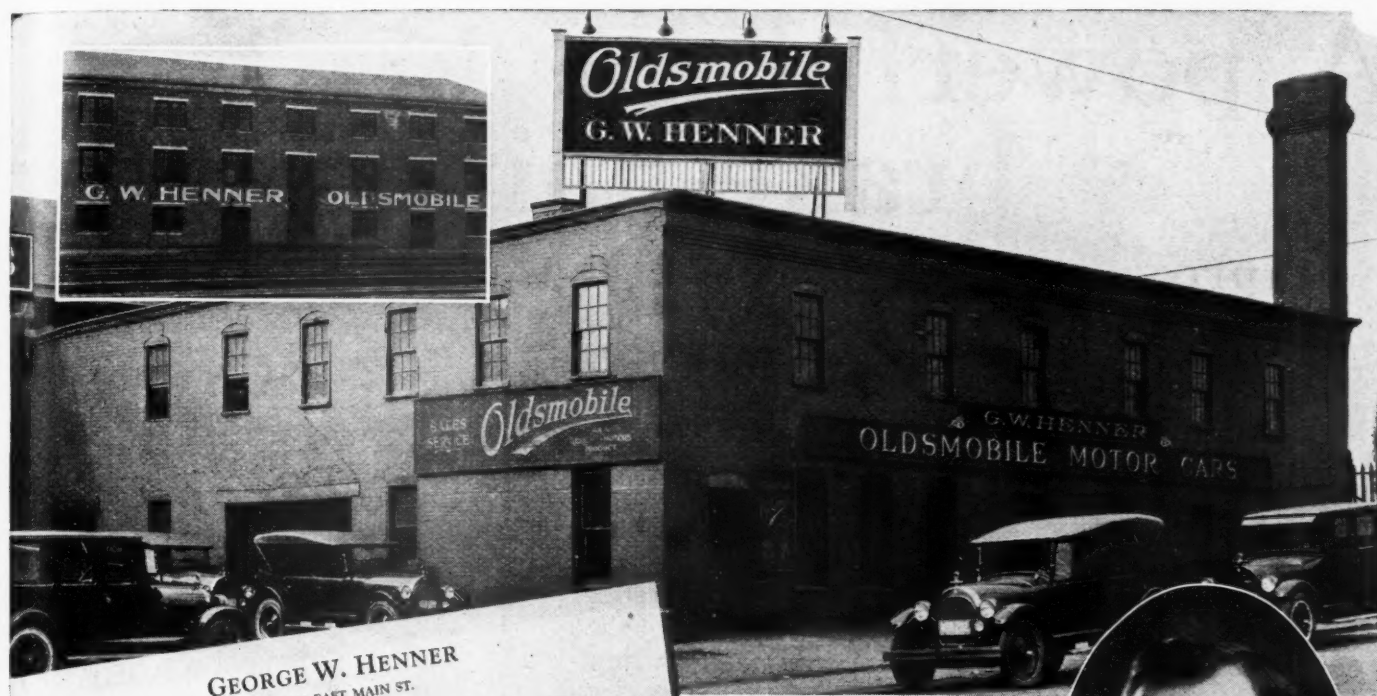
*—Electric
†Generator only
*—At extra cost
‡—On Phaeton models
A—Aluminum
Anst—Ansted
Ad—Adams
A-K—Atwater-Kent
A-L—Auto-Lite
B—Semi Steel
Bal—Ball & Ball
B & B—Borg & Beck
B-I—Both Internal and External Four Wheels
Bij—Bijur
B-L—Brown-Lipe
Blo—Blood
Bos—Bosch
C—Cast Iron
Car—Carter
Ch—Chimax
Col—Columbia
Con—Connecticut
Cont—Continental
Cpl—Campbell

D—Multiple Disc
Del—Delco
Det—Detroit
De J—De Jon
Dit—Ditwiler
Doo—Dooley
Dtl—Detlaff
Dues—Duesenberg
Dur—Durstion
Dyn—Dyneto
E—Full Elliptic
E-F—External Four Wheels
E-R—External Rear Wheels
E-T—External Transmission
Eat—Eaton
F—Full Floating
Fall—Falls
Flt—Flint
FP—Full Pressure to all bearings including wrist pins
Ful—Fuller
1/2 F—Semi-Floating
3/4 F—Three-Quarter Floating
G—Head and Side
G-D—Gray & Davis
Gem—Gemmer
G-L—Grant-Lees

Goo—Goodrich
H—Horizontal
Har—Hart
Hol—Holley
Hoo—Hoosier
H-Sp—Herschell-Spillman
Hyd—Hydraulic
I—In Head
I-F—Internal Four Wheels
I-R—Internal Rear Wheels
J—Three-Quarter Elliptic
Jac—Jacob
Jax—Jaxon
Joh—Johnson
Jon—Jones
K—Cone
Kin—Kingston
L—L Head
Lav—Lavine
Lon—Long
L-N—Leece-Neville
Lyc—Lycoming
Mar—Marvel
M—Metal
M & E—Merchant & Evans
Mec—Mechanics
Mons—Monson

Mun—Muncie
N—Platform
Non—None
N. E.—North East
Nor—Northway
O—Special Type
Opt—Optional
P—Single Plate
PC—Pressure to all Crankshaft and connecting rod bearings
Pen—Penfield
Pet—Peters
Pic—Pick
PK—Pressure to Crankshaft, Connecting Rods, and Camshaft Bearings
PS—Splash and Pressure
Q—Quarter Elliptic
R—Fabric
Ray—Rayfield
Rem—Remy
Roc—Rockford
Ros—Ross
S—Semi Elliptic
Sal—Salisbury
Sch—Schebler
Sci—Scintilla

Sco—Scoe
Sne—Snead
Sp—Circulating Splash
Spe—Special
Spi—Spicer
Spl—Spitdorf
S. E.—Standard Equipment
Sta—Standard
Ste—Stewart
Stl—Sterling
Str—Stromberg
T—T Head
The—Thermoid
Thl—Thilmer
Til—Tillotson
Tim—Timken
Uni—Universal
V—Cantilever
W-G—Warner Gear
W-M—Willys-Morrow
Wag—Wagner
War—Warner
Weld—Weldley
Wes—Westinghouse
Wis—Wisconsin
X—Sleeve
Zen—Zenith



GEORGE W. HENNER
980-1000 EAST MAIN ST.

Oldsmobile
ROCHESTER, N. Y.

October 15th, 1924

Mr. Guy H. Peasley,
General Sales Manager,
Olds Motor Works,
Lansing, Michigan.

Dear Mr. Peasley:

I just want to tell you that Oldsmobile Six cars are standing up wonderfully well, and if you care to refer any dealer to me, I would be glad to recommend the agency.

As you know, I have handled the Oldsmobile since 1913. From 1910 to 1913 I handled several other makes of cars, and it was a case of company going broke or not standing back of the goods, so at that time I was careful in picking my agency.

Today we are the fourth largest dealer in Rochester and we expect, in 1925, to occupy first place.

Very truly yours,

George W. Henner

GWH:W



Geo. W.
Henner

"Refer Any Dealer To Me"

George Henner has sold Oldsmobiles for eleven years, and has built up one of the best retail businesses in Rochester.

Perhaps Oldsmobile offers a similar opportunity in *your* territory.

OLDS MOTOR WORKS, Lansing, Michigan

OLDSMOBILE SIX

PRODUCT OF GENERAL MOTORS

A powerful brake-lining cutter

improved with new features

HERE is the famous Goodell-Pratt Brake-Lining Cutter with its new improvements. This cutter can now easily cut brake lining no matter how tough or dense it may be.

Fine for cutting belting and shim material, too.

The long handle, which is knurled so your fingers won't slip, gives an extraordinary leverage that is transmitted to the upper blade and transformed into a powerful shearing motion. The bottom shear plate is now horizontal—a part of the bed. Two screws make this bottom shear plate easily adjustable.

Blades are made of carefully hardened and tempered steel and are easily removable for sharpening.

Iron parts finished in red and black enamel. Exposed steel parts nicely polished. Weight, 33 pounds. Cutting-capacity—sizes up to 6 inches wide and $\frac{1}{2}$ inch thick.

Other tools for motor repair work

In the free Goodell-Pratt Catalog No. 15 are shown many other essential tools for service stations, garages, mechanics and automobile owners. Write for a copy.

GOODELL-PRATT COMPANY
GREENFIELD, MASS., U. S. A.

Toolsmiths

Makers of Mr. Punch



Brake-Lining
Cutter

No. **739**

Price \$16

GOODELL- PRATT

1500 GOOD TOOLS

Partial List of SCHEBLER PACKAGE OUTFITS

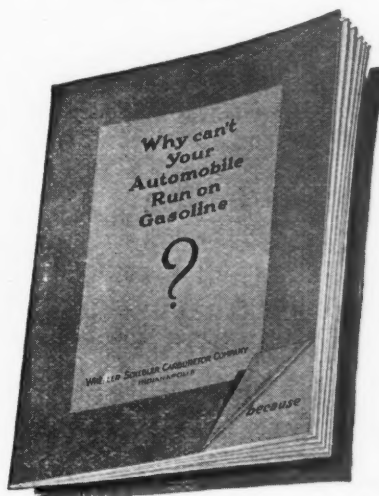
The NEW Schebler Model "S" Carburetor and other leading Schebler Equipments are supplied in convenient, complete packages for the individual make of car as listed below. Accuracy of each carburetor and completeness of package unqualifiedly guaranteed.

Chevrolet	Nash
Chrysler	Oakland
Dodge	Oldsmobile
Essex	Overland
Ford	Reo
Hudson	Rickenbacker
Hupmobile	Studebaker
Maxwell	Willys-Knight
Continental Motors	

Proof!

The NEW Schebler Model "S" Carburetor has already been adopted as standard equipment on the following automobiles—and these cars all start easily in winter!

Apperson-8	Elcar
Auburn-8	Moreland Buses
Case	Rajo Heads
Chandler	Red Ball Trucks
Cleveland	Reo
Cole	Stearns-Knight
Dagmar	Wills-St. Clair
DuPont	



Write for this free booklet, which explains thoroughly in non-technical terms what EXACT Carburetion is—and why EXACT carburetion pays so well.



EXACT Carburetion Pays

JUST TRY the NEW Schebler Model "S" Carburetor—with its scrupulously exact carburetion—on your car, and see the difference.

Exact carburetion means more miles per gallon. Instant starting, more power, faster acceleration, and longer engine life.

The NEW Schebler Model "S" gives scientifically accurate fuel mixture ratios for every operating condition. And it pays. In a little over a year the NEW Schebler Model "S" has been adopted as standard equipment on many of America's best known automobiles.

Our engineering department maintains an information service for automobile dealers, service stations and owners. Write us for specific information on any carburetor problem.

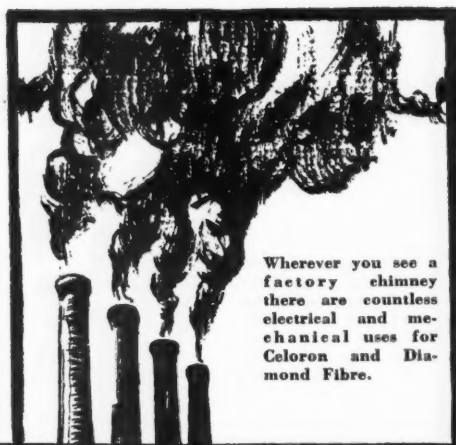
WHEELER-SCHEBLER CARBURETOR COMPANY
INDIANAPOLIS

SCHEBLER

The World's
Finest CARBURETORS



the leading



Wherever you see a factory chimney there are countless electrical and mechanical uses for Celoron and Diamond Fibre.

In more than a million cars Celoron Silent Timing Gears have proved the most dependable gears for insuring permanent silence.

At the Auto Shows

At the Automobile Show cars equipped with timing gears of stabilized Celoron will be shown. These gears are standard equipment on a number of the best known makes of American cars.

Service stations and repairmen all over the

DIAMOND STATE FIBRE COMPANY

DIAMOND STATE



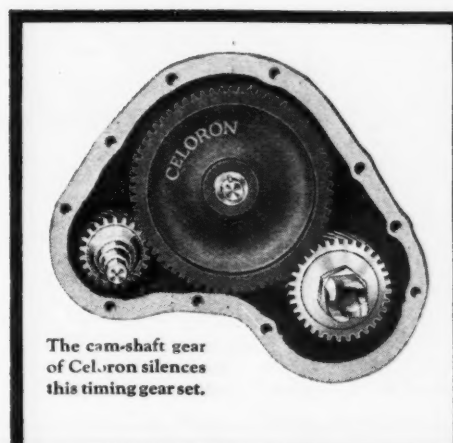
fabric gears

country are advising the replacement of worn metal gears with gears of stabilized Celoron. Jobbers and dealers throughout the country carry stocks of these gears.

The Diamond State Fibre Company is the largest and oldest manufacturer of laminated bakelite materials and vulcanized fibre in the world.

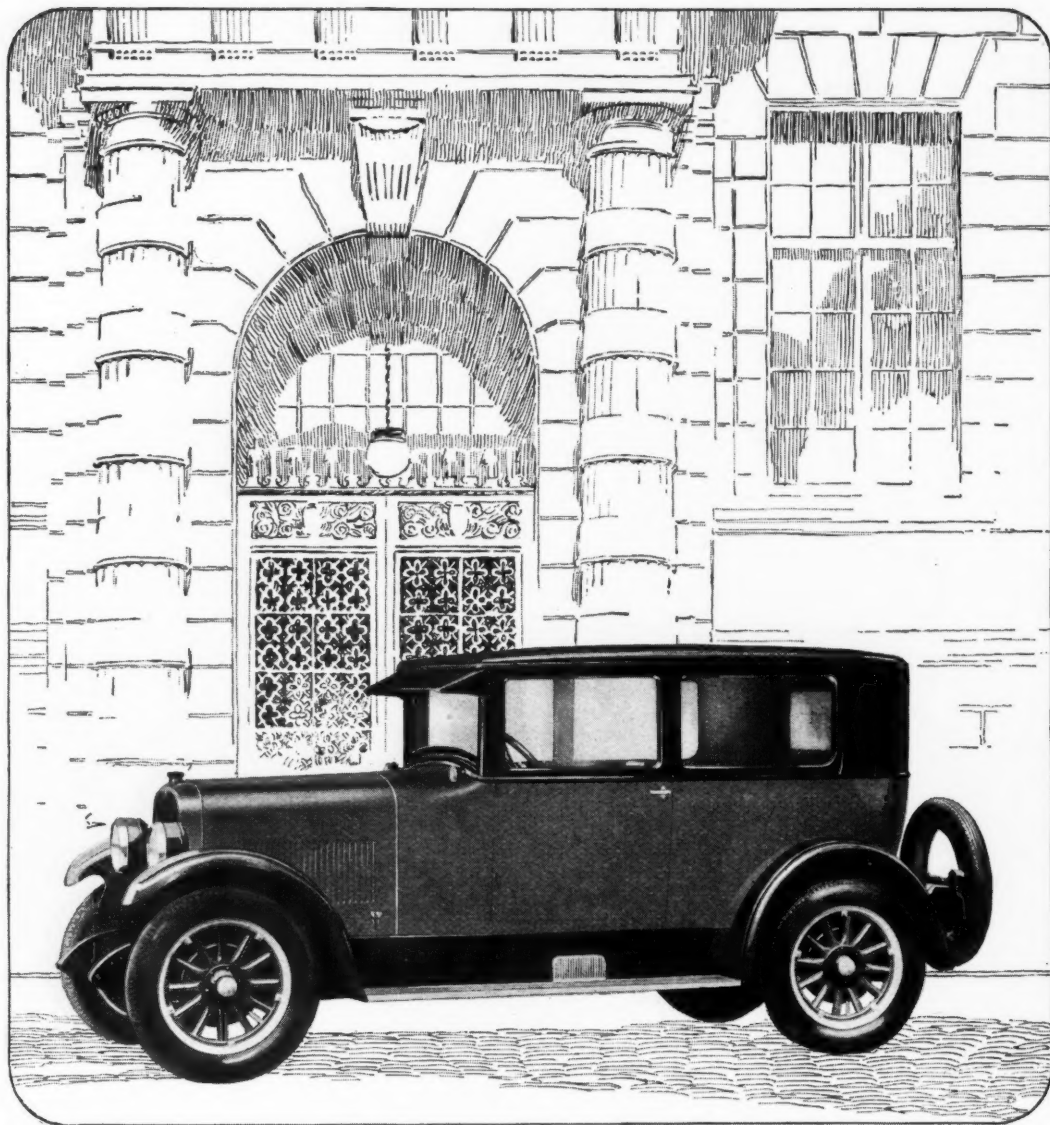
Look for the "Celoron" mark, and be sure you get a genuine Celoron Silent Timing Gear.

BRIDGEPORT, PA., AND CHICAGO, ILL.



The cam-shaft gear of Celoron silences this timing gear set.

FIBRE COMPANY

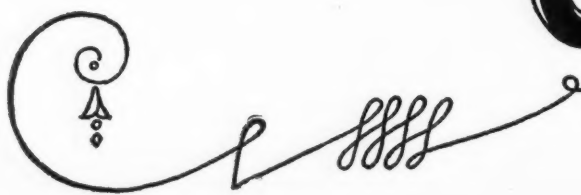


Announcing

The Coach Premier

which combines at a new low price closed car comfort and the brilliant performance qualities of the Cleveland Six chassis.

CLEVELAND



"... coach construction need not imply cheap construction"

Motoring America has been anticipating the announcement of a Cleveland Six coach—

—for Cleveland Six performance qualities have been too sensational—too history making, to be long unavailable in a closed car of extremely moderate price.

At \$1295, this new model carries the lowest price ever placed on a 5-passenger closed body mounted on the improved and enlarged Cleveland Six chassis. Yet it is characterized by a smartness of appearance and a degree of comfort that marks a radically new development in this popular type of body.

Body by Fisher Bloomfield Grey and Black—Duco

The Fisher Body, so obviously solid, substantial and sturdy, clearly and conclusively demonstrates that coach construction need not imply cheap construction.

All contours are achieved by pleasing curves instead of angular corners. The color is a smart combination of Bloomfield grey and black. The finish is Duco.

35-inch Doors Afford Unobstructed Passage

The 35-inch doors afford a clear and unobstructed passage to and from the rear compartment. Not only is the rear seat unusually wide, but ample leg room has been provided. The over-all length of the body is only 4" less than

the longest and most expensive Cleveland Six sedan obtainable.

V & V Windshield Many Additional Conveniences

Every desirable closed car convenience is conspicuously present. The vertically sliding Fisher V & V Windshield provides all degrees of ventilation by means of a crank regulator. The windows are full vision and operate by turn handles. The three at the rear have roller curtains.

The upholstery is a durable attractive taupe grey worsted; the hardware finished in matte silver. The equipment includes automatic dash controlled window wiper, leather covered sun visor, cowl lamps, dome light, and full width foot rail.

Comfort Plus History-Making Performance

Here is a closed car that provides snug comfort plus all the qualities that have been responsible for the wildfire success of the chassis on which it is mounted: Flashing pickup—sensational high gear performance—a national economy average exceeding 20 miles to the gallon—

—plus the convenience of the "One-Shot" Lubrication System, which enables the driver to lubricate all 23 chassis parts simply by stepping on a plunger!

See the Coach Premier and enjoy a genuine revelation in closed car values!

CLEVELAND AUTOMOBILE COMPANY • CLEVELAND
Export Address, 1819 Broadway, New York City Cable Address, "Cleveauto"
(The "One-Shot" Lubrication System is licensed under Bowen Products Co. patents)

\$1295

With Balloon Tires
f. o. b. Cleveland

AND SIX



Replace with

FOSTORIA FENDERS

"In a Hurry!!"

THAT'S what every one says when it comes to fenders. No car owner is going to wait for his car while you order fenders from some far-off factory. The Fostoria system of distribution makes it possible for you to get just the fenders you want from the Fostoria distributor nearest you in the minimum of time.

Wherever you are, you can get a new Fostoria Fender without delay, and at a price that enables you to cash in to the fullest extent on the tremendous possibilities of the fender replacement market.

Fostoria Fenders are easily attached by anybody. No special tools are needed.

The low price provides a handsome profit for you and pleases the car owner.

In weight, quality, design and finish Fostoria replacement fenders are equal to or better than original equipment.

Every Fostoria Fender is carefully jigged after assembly. Perfect fit is guaranteed.

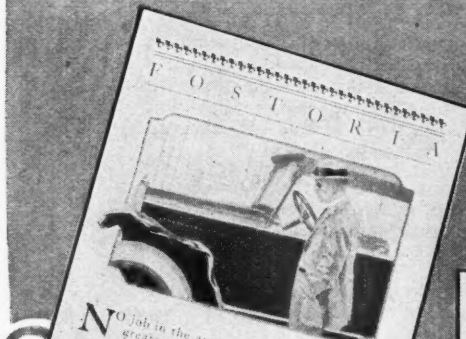
Fostoria Fenders are made in the largest factory in the world devoted exclusively to replacement fender production.

OPEN DEALERSHIPS

Distributors of Fostoria Fenders are making big profits in constantly increasing volume. Many good territories are still open to dealers and sub-dealers. Yours may be one. Write for our proposition.

Look for the name of your nearest distributor in the Chilton Automobile Directory. Use the coupon below for our booklet on the profits in fender replacement.

THE FOSTORIA PRESSED STEEL COMPANY, Department B, FOSTORIA, OHIO




NO job in the automobile service shop offers greater opportunity for profit and satisfaction than fender replacement. Fender damage is one of the most frequent automobile casualties. It is by far the most common. No car owner likes to drive with a bent and dented fender. His pride in car ownership will send him straight to a service shop.


Almost without exception any damaged fender is ready for the scrapheap. Only the most superficial injuries can be properly cured by straightening. In most cases it costs more in labor time than the price of a new Fostoria Fender to take the wrecked out of a bent fender. The car owner is seldom satisfied with a repair job. The cost of a new Fostoria Fender is so little that he cheerfully pays for it.

Fender business is a replacement business rather than a repair job. The garage man who gets that view of it, and who specializes in repairs, is going to make more money in fender situation with a hammer.


Fostoria Fenders are easy to get. In the midst of every market there is a distributor of Fostoria Fenders, ample stocked with a complete line. [Foster price]



FOSTORIA FENDERS



Manufactured by
THE FOSTORIA PRESSED STEEL COMPANY
Fostoria, Ohio, U. S. A.



Chandler

Model	Year	Front Fenders	Cor. in Mfg. Part No.
All Models	1918-19-20-21	7016-18	
Touring	1919-20-21	7019-20	
Dispatch Sedan	1919-20-21	7020-29	

Oldsmobile

Model	Year	Front Fenders	Cor. in Mfg. Part No.
All 37-A Six Cyl. Models	1919-20	336388-89	
All 43-A and 47 Models (Service Fender)	1921-22	336350-51	
37-A Six Cyl. 5-pass. Touring	1919-20	336350-51	
43-A Four Cyl. 5-pass. Touring	1921-22	336352-53	
47 4-pass. Touring	1922		

Send for Your Copy of This FREE Hand Book Use the Coupon →


The Fostoria Pressed Steel Co., Dept. B. Fostoria, Ohio.

Send me your free booklet on Fender Replacement marketing.

Your Name.....

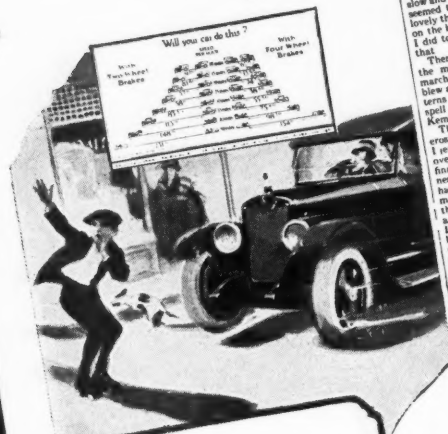
Address

A NAME THAT CARRIES WEIGHT



Thermoid is 40 per cent.
heavier than ordinary
lining. Behind Ther-
moid is the weight of an
old established reputa-
tion and the strongest of
national publicity.

Thermoid
Hydraulic Compressed
Brake Lining



IS---
WHEN a boy darts around a corner directly in your path. Why?

(Continued from Page 70)
slow and dreaming on the grass. The music seemed to be all about her. She was so lovely that the timid cousin and I, huddled on the hill away from people, cried. Yes, I did too—cry. She was as wonderful as that.
Then she was sitting on the throne with the maids about her and the pageant marched, and the dancers like lovely petals, and the music and the crowd in melting terms of color. But I was still under her spell. At that moment I couldn't blame Kemper for adoring her.
This interval of truly remarkable generosity lasted about ten minutes. And then I jerked my head suddenly and Horace told over my eyes, scratching my nose. That was the meanest and the had-had-had-had. All the meanest and the had-had-had-had. I couldn't stand it any more. So I got up and, without a word, the astonished cousin, fled down the path and a cross the path to the house. I held Horace bumping on my head and a huge drop of water dashed on my hand. Then came another spitting to rain. I thought, lovely dress and lovely dress and lovely dress in the rain, I hoped it would rain.
I was behind me I was going to swing my back. Horace.

Watch Our
National
Advertising

How Do You Select Your Brake Lining?

BRAKE lining may not be a large part of your business. But it is an important one. How do you select the kind of brake lining which you will recommend to your customers?

Do you select a little-known brand, which you must vouch for on your own responsibility? Or have you come to see the wisdom of standardizing on Thermoid—the lining with a name that carries weight with trade and public alike?

Weight. Literally and figuratively.

A foot of Thermoid contains at least 40 per cent more weight of material than the heaviest of other linings.

Behind Thermoid is 25 years of unquestioned reputation and years of consistent national advertising.

Behind Thermoid is the name and reputation of one of the oldest and most widely known manufacturers of automotive products.

When you are in the market for any product from a package of cigarettes to an automobile, isn't it the *well known* name that carries weight with you?

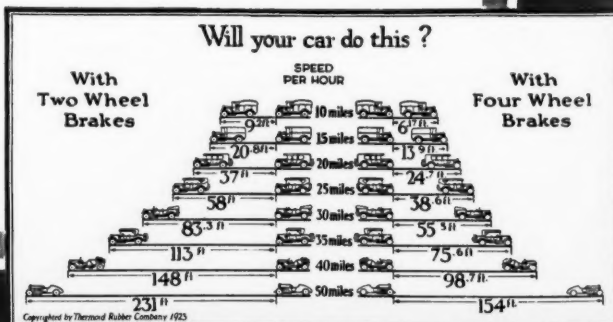
Your customers feel the same way. Why spend your valuable time trying to convince them that an unknown is "just as good," when they are already primed to buy Thermoid without any argument?

The chart below shows the distances in which your car should stop—if your brakes are right

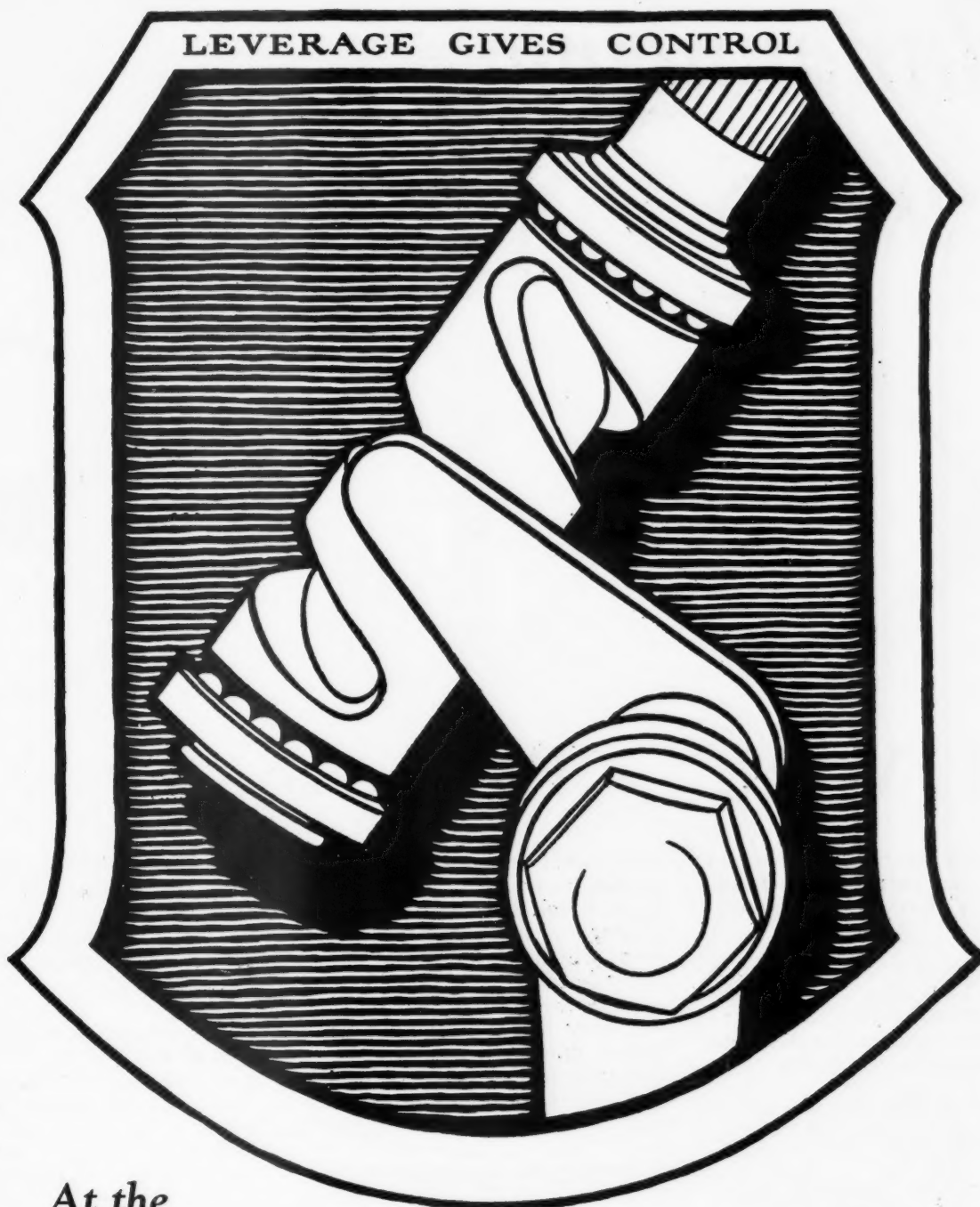
THERMOID RUBBER COMPANY

Factories and Main Offices
TRENTON, N. J.

Makers of Thermoid and Rexoid Transmission Lining, Thermoid-Hardy Universal Joints and Mechanical Rubber Goods



Thermoid Hydraulic Compressed **Brake Lining**



At the


NEW YORK SHOW : *Space No. 279*

JANUARY 2-10

CHICAGO SHOW : *Space No. 1*

JANUARY 23-31 (North Hall Gallery)

ROSS GEAR AND TOOL COMPANY, 400 Heath Street, Lafayette, Indiana

ROSS
CAM and LEVER  **STEERING GEARS**
EASIER STEERING **LESS ROAD SHOCK**

Announcing the New

K I S S E L

F I V E P A S S E N

First of the finer closed cars to sell at an open car price—the beautiful new Kissel Brougham, \$1895!

In introducing this great value at the New York Show, Kissel again gives unmistakable evidence of its far-seeing progressiveness and rare manufacturing genius.

In no wise is this new Brougham to be compared with other closed cars selling at open car prices. In the first place, the custom-built body is the same solidly constructed Kissel body you have always admired, except that it is smarter looking than ever, with longer lines of sweeping gracefulness, a more spacious interior, comfortable form-fitting seats with genuine Chase Mohair upholstery, large 30-inch doors and larger windows giving clearer vision.

Toned a rich lustrous black (Duco finish) with crimson wheels and crimson three-line stripe. Balloon tires and hydraulic four-wheel brakes without extra cost.

Other outstanding features of this

new Kissel include specially designed frame with "kick-up" in front, which gives a low center of gravity; spring side-play adjustment which, by means of a specially designed spring-hanger with adjustable bearing, prevents all side-play in springs; hand-fitted bronze graphited bearings which form a silent, velvet-like cushion at all working points and practically eliminate rattles and squeaks.

Moreover, this Brougham chassis, like all Kissels, is equipped with an entirely new Automatic Lubrication System under Sidney Dawson patents. With one filling this car can be driven several hundred miles without giving a thought to chassis lubrication.

But above and apart from all these features is the now famous "Latest Advance Engineered Kissel Motor" which powers this great car. This motor, which can be driven continuously at 70 miles an hour for hours at a time without fear of burning out bearings and which will travel 25,000 miles and more without the usual service work, is

the same which Colonel Wall drove over the Indianapolis Speedway in a grueling test and proclaimed to be one of the staunchest, smoothest-performing engines he had ever encountered.

Oil is forced to every working part of the "Latest Advance Engineered Kissel Motor" under pressure. All reciprocating parts have been lightened. Cylinder walls have been honed to glass smoothness. Thermostatic control, an integral part of the cylinder head, results in better thermal efficiency of engine, more power, less gasoline consumption.

From every standpoint, this new Brougham measures up to the high manufacturing standards of Kissel and maintains Kissel's outstanding reputation for style leadership. It is bound to receive an enthusiastic ovation at the Show and win immediate nation-wide popularity, not only because it is the first fine car ever to sell at an open car price, but because of the clear-cut distinctiveness of its quality.

KISSEL MOTOR CAR COMPANY, HARTFORD, WISCONSIN

Other Kissel Sixes Shown at New York:

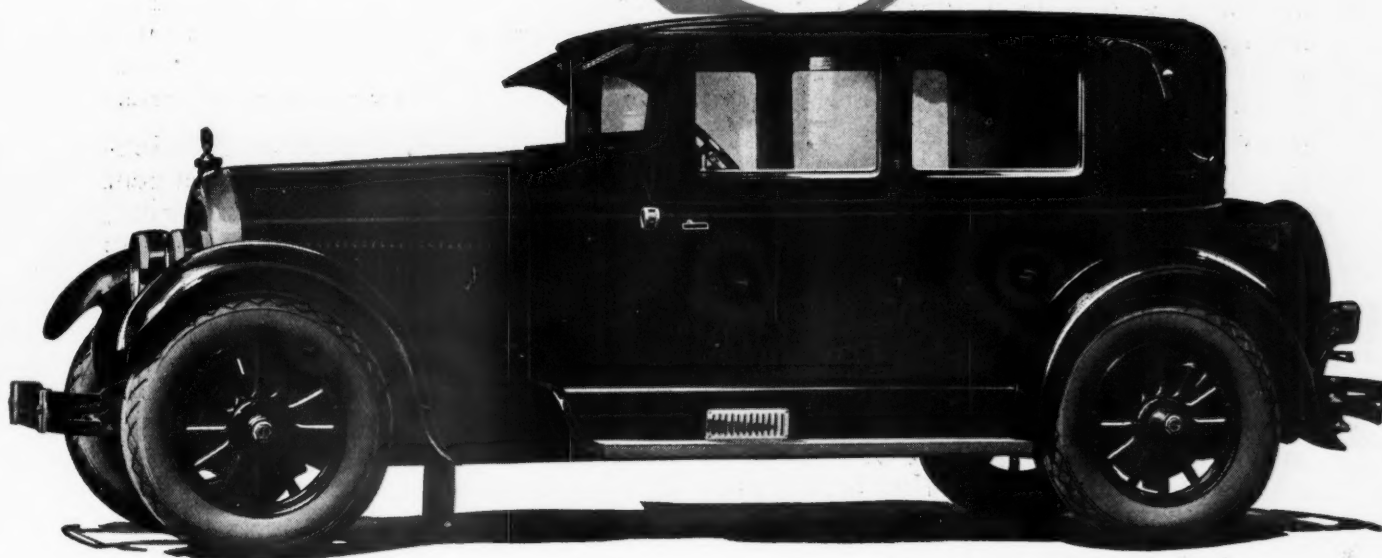
Silver Anniversary Speedster

Enclosed Speedster

CUSTOM  BUILT

SEEL

GERBROUGHAM



\$1895⁰⁰

*Including Hydraulic 4-Wheel Brakes—Balloon Tires
Standard Equipment
F. O. B. Hartford*

Announcing the New KISS

Kissel, at the New York Show, presents for the first time a "Straight Eight."

It is the Eight of all Eights—an out-and-out revelation, a startling sensation, a triumphant achievement in the development of the "Straight Eight" type of motor. It is an Eight only as Kissel, and Kissel alone, could build.

You have never in all your motoring career encountered anything like the soft pliancy, nimble acceleration, flashing speed and masterful power of this great Eight. To drive it is to experience an entirely new and stimulating delight in every thrilling mile.

In it are incorporated all of the Latest Advance Engineered Kissel features, including high pressure oiling system, light weight reciprocating parts, new type of aluminum oil basin and thermostatic control. Its bore and stroke is $3\frac{3}{16} \times 4\frac{1}{2}$ —larger than that of most Eights.

Being a Kissel, you will naturally expect much in body beauty. You will not be disappointed, for of all the beautiful Kissels that have been built, this new

Eight surpasses them in artistry of design and regal elegance. Kissel did not enter the Eight class until it could build the "class" of the Eights.

All models have that long, low-hung gracefulness which has always marked Kissel as the most distinctive of fine cars. All models have unusually roomy interiors, and this new Sedan has four wide 32-inch doors instead of the usual 28-inch doors of most cars. Note particularly the extra long windows which give clearer vision. All models have these famous and exclusive Kissel features:

Specially designed frame with "kick-up" in front; spring side-play adjustment which prevents all side-play in spring; hand-fitted bronze graphited bearings which eliminate rattles and squeaks; automatic chassis lubrication system under Sidney Dawson patents.

In presenting this Eight in various models and in striking color combinations, Kissel blazes a new trail and sets a new standard of style and performance for the automobile industry.

The new Kissel Eight will be shown in the following styles at the New York Show: New Victoria, toned a deep, rich black, with vermilion stripe on wheels and running gear. DeLuxe Brougham-Sedan in Brunswick green with straw colored wheels and stripes. Seven-passenger Sedan in dust-proof gray, with azure blue stripe on wheels.

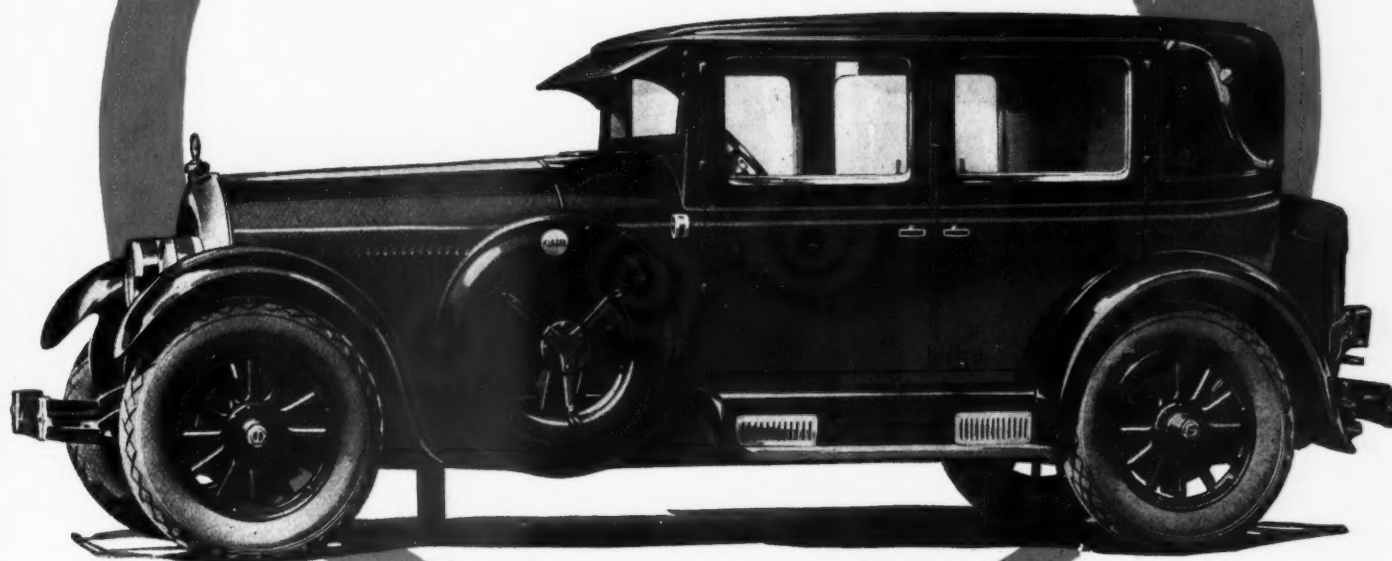
Hydraulic 4-wheel brakes and balloon tires standard on all models without extra cost.

KISSEL MOTOR CAR COMPANY, Hartford, Wisconsin

CUSTOM BUILT



SEAL



The New DeLuxe Brougham-Sedan

ATWATER KENT

R A D I O

BACK OF ATWATER KENT Receiving Sets and Loud Speakers is the largest plant of its kind in the world. The strength of the ATWATER KENT organization, combined with its laboratory and manufacturing facilities, is an assurance to every dealer that the ATWATER KENT line will hold a position of permanent leadership.

Into ATWATER KENT Radio is built the knowledge and skill of over a quarter century's experience. Each part, from the tiniest wires to the polished cabinets, is designed and manufactured with infinite care. The ATWATER KENT tradition of using only the finest materials that money can buy guarantees the highest possible quality.

Descriptive literature on request

ATWATER KENT MANUFACTURING COMPANY
4733 Wissahickon Ave., Philadelphia, Pa.

Pacific Coast Prices
slightly higher



T H I N K W H A T I S B A C K O F I T

What Do You Mean— ? Big Production ?

Mere size of factories or of daily production don't mean a thing to a tire dealer except—

- a lot of dealers selling the same tire in his locality.
- less margin of profit because of interest charges on big capitalization and indebtedness.
- less quality—for the same reasons.
- less personal contact with factory executives.

The smaller tire company can give the independent dealer more in every way.

The
Original



line of tires lives up to their name—absolutely. Some of our dealers tell us they are the best tires made in Akron—or America. We prefer to make such tires than to sell “all the tires in the world.”

Our dealers get exclusive territory—they get a complete line—backed by a complete program of local advertising. They make good profits and are able to build permanent businesses of their own.

A few territories can be added for 1925. Perhaps yours is open. Write for the details of our 1925 proposition.

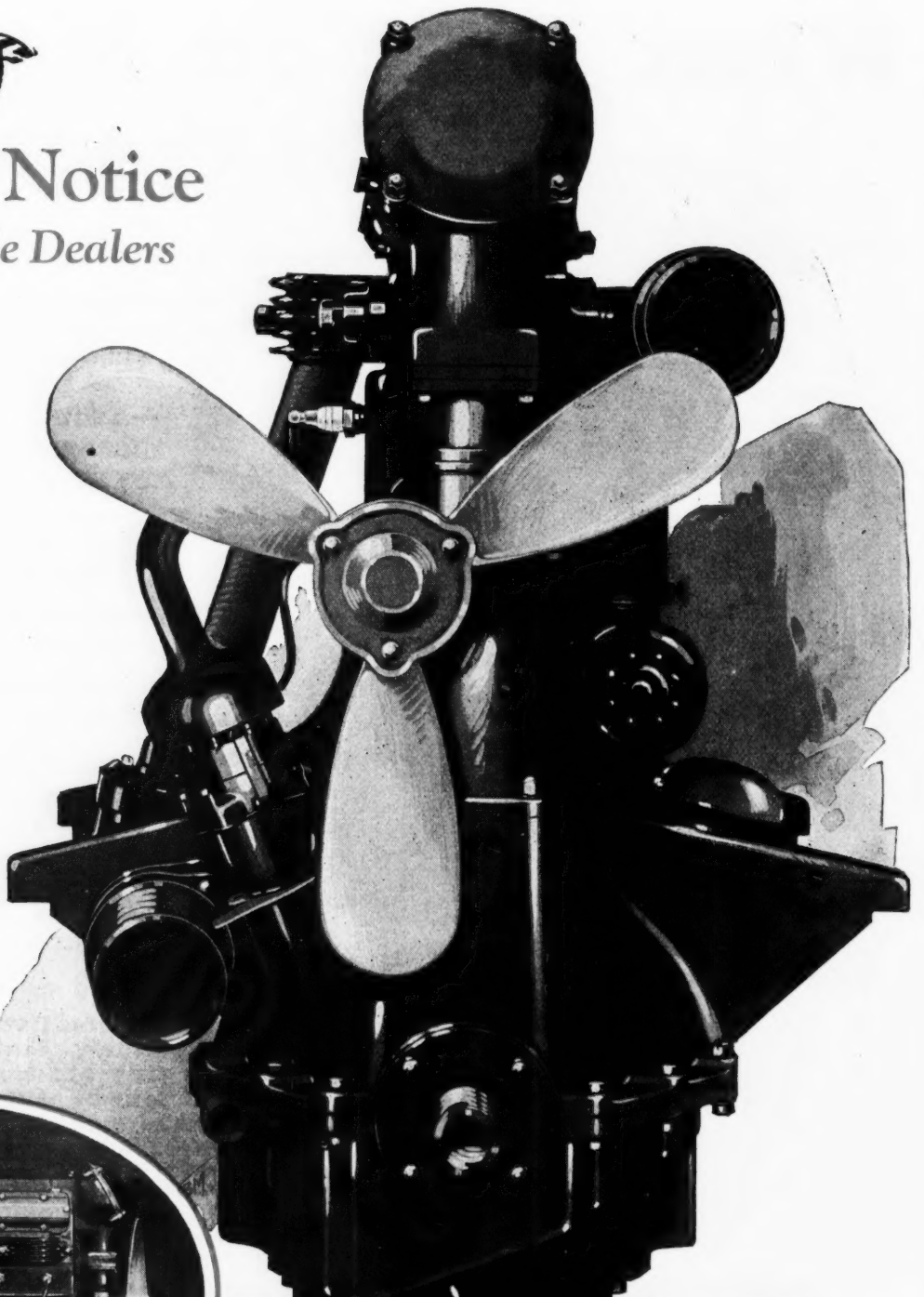
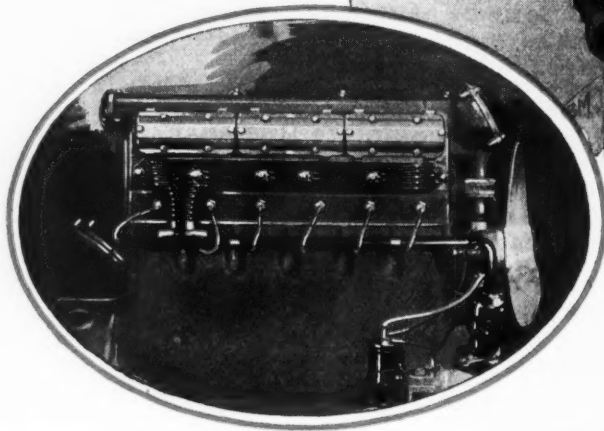
Makers of the famous American-Akron Air Bag—praised by vulcanizers everywhere. Write for information and prices.

The American Rubber & Tire Co.
Akron, Ohio, U. S. A.





Advance Notice
to Automobile Dealers



WILLS
SAINTE CLAIRE
SIX

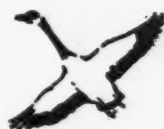
Another Triumph of the Master Metallurgist of the Automobile Industry

"I want it known that we are deliberately departing from common practice in announcing to the trade the addition to our line of the Wills Sainte Claire Six well in advance of the time when these cars will be offered the public.

Despite the fact that the Wills Sainte Claire Six has been in production for weeks, I do not intend to put these cars on sale until I know that they can be supplied in quantity.

We are therefore building up a reserve so that when the Wills Sainte Claire Six is publicly announced, there will be none of that pellmell, eleventh hour haste and uncertainty which usually accompanies the introduction of a new car and which is always so ruinous to dealers and disappointing to purchasers."

—C. HAROLD WILLS



DEALERS—now is the time to seriously consider the Wills Sainte Claire franchise.

You know the merits of our "Eight." Now focus your attention on the added sales advantages assured to you by the addition to our line of the *Wills Sainte Claire Six*—ready in volume for Spring delivery

—powered by an unduplicated 6-cylinder, 7-bearing engine, designed by C. H. Wills—with silent overhead camshaft and valves, same as in the "Eight"

—perfect distribution of gas in the combustion chamber and efficient lubrication, which obviates frequent valve grinding and carbon removal

—water cooled oil

—acceleration from 5 to 25 miles per hour in 6 seconds; from 5 to 45 miles per hour in 17 seconds

—four wheel Hydraulic brakes, and disc wheels standard

—a complete line of quality motor cars in both "Sixes" and "Eights," offering a wide price range and a body style for every taste and need.

Wills Sainte Claire, Inc., is a sound Company—free of indebtedness—financially able to cope with any situation that can possibly arise.

The *Wills Sainte Claire Six*, together with the complete line of Wills Sainte Claire Eights, will be shown at both the New York and Chicago Shows.

IMPORTANT—Both "SIX" and "EIGHT" demonstrators will be available to you at the Shows.



WILLS SAINTE CLAIRE, Inc.
MARYSVILLE, MICHIGAN

WILLS SAINTE CLAIRE

The Aristocrat

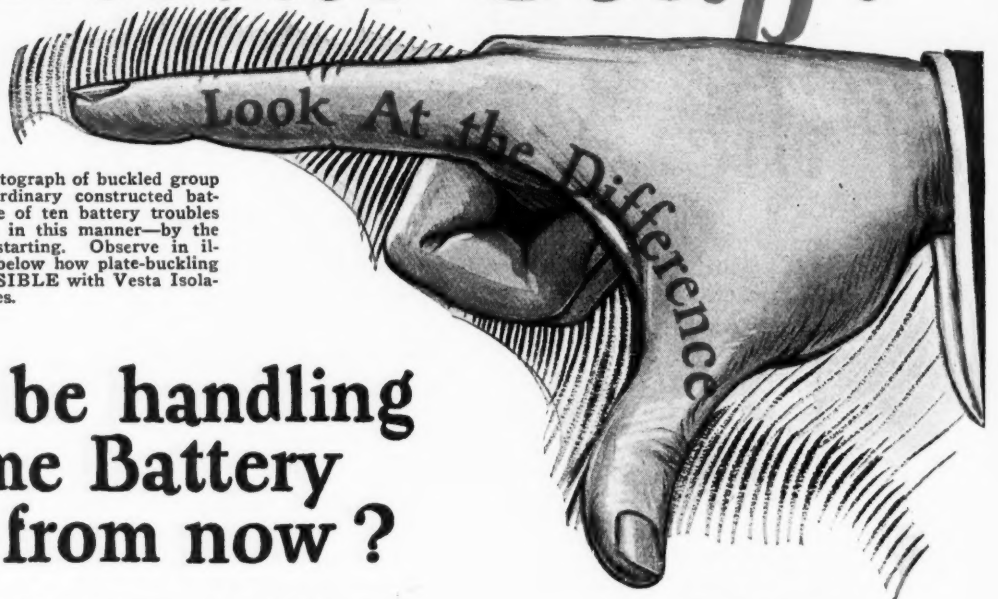


of Motor Cars



Actual photograph of buckled group from an ordinary constructed battery. Nine of ten battery troubles are caused in this manner—by the strain of starting. Observe in illustration below how plate-buckling is IMPOSSIBLE with Vesta Isolator batteries.

Inside Stuff!



Will you be handling the same Battery 5 years from now?

Viewed from the outside a battery is a battery no matter who makes it, BUT—on the inside "There's a World of Difference!"

Car owners are learning from costly experience that it pays to LOOK ON THE INSIDE. They realize that what they are actually seeking is the MOST MONTHS OF BATTERY SERVICE. To give this, a battery must have IN-BUILT quality. It must be reinforced against the high starting strain.

750,000 have selected Vesta in preference to original equipment

It's a safe bet that these three-quarter Million owners LOOKED ON THE INSIDE. They got the facts, and then bought Vesta.

More Than Quarter of Century

Vestas are "Proven Quality Batteries"—for over 27 years. Why spend your good time, and money, and risk your reputation on an inferior construction when Vesta will make your customers PERMANENT CUSTOMERS?

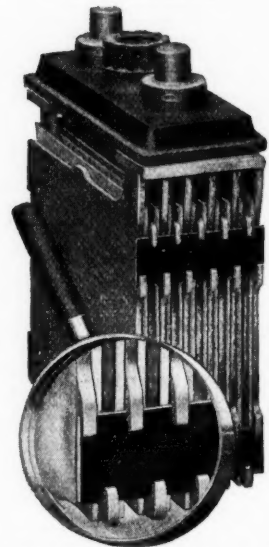
Don't take a chance—handle Vesta! Start 1925 right by letting Vesta team-together with you to build greater sales—greater profits—greater reputation. Write NOW!

Vesta Battery Corporation, CHICAGO

VESTA

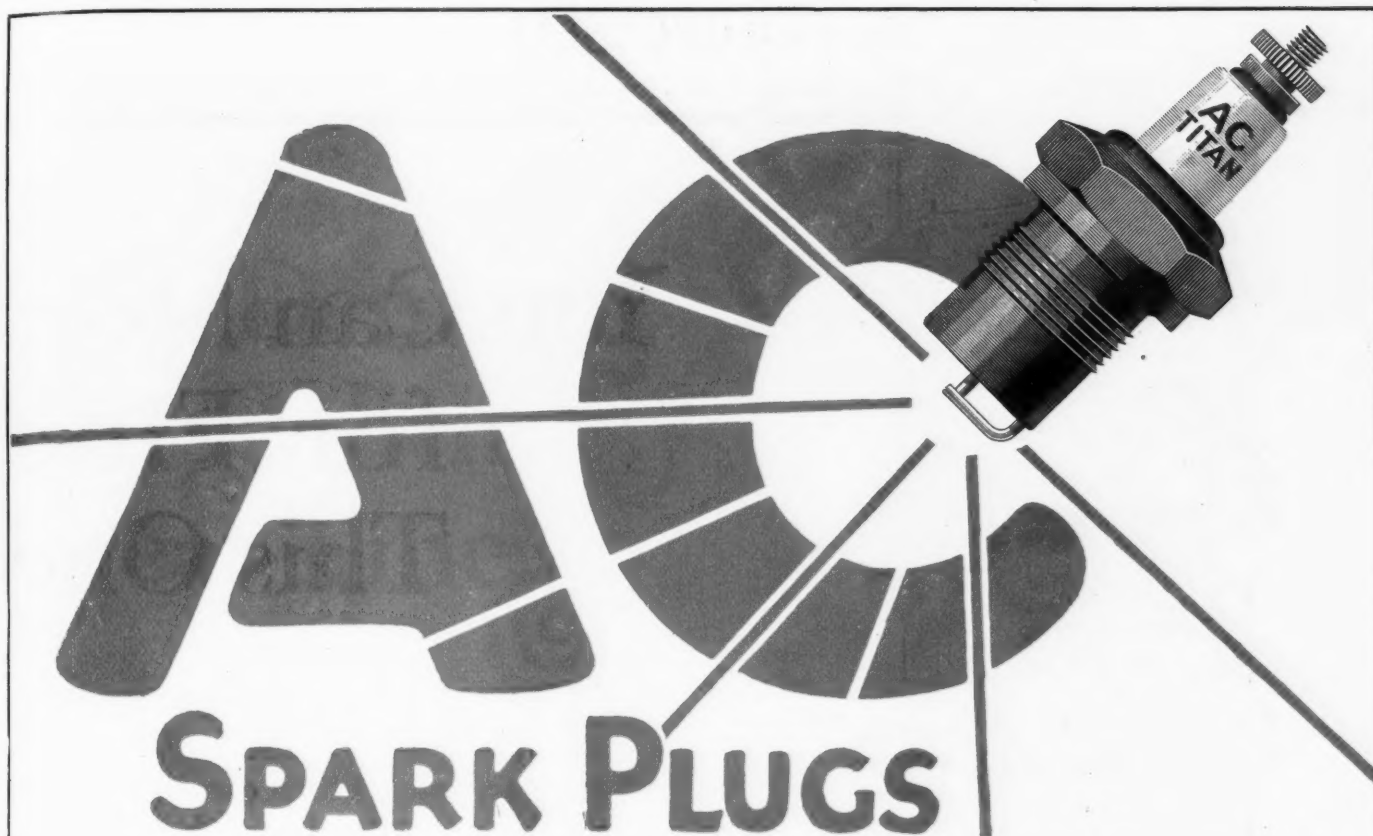
COSTS LESS PER MONTH OF SERVICE

The ISOLATOR Is Patented



This Is an Exclusive Vesta Feature





The National Verdict *AC's Are Best*

As in years past, AC Spark Plugs dominate the national automobile shows. The foremost automotive engineers—experts on ignition—specify AC's as standard equipment. AC's are the proven plug for the very good reason that AC's perform best.

These Cars at the Show are AC-Equipped

Ambassador.....AC	Cleveland.....AC	Haynes.....AC	Oakland.....AC
Apperson.....AC	Cole.....AC	Hudson.....AC	Oldsmobile.....AC
Buick.....AC	Davis.....AC	Hupmobile.....AC	Paige.....AC
Cadillac.....AC	Dodge Brothers..AC	Kissel.....AC	Star.....AC
Case.....AC	Du Pont.....AC	Marmon.....AC	Stearns.....AC
Chandler.....AC	Durant.....AC	Maxwell.....AC	Westcott.....AC
Chevrolet.....AC	Essex.....AC	McFarlan.....AC	Wills Sainte
Chrysler.....AC	Flint.....AC	Nash.....AC	Claire.....AC

Of the 51 cars exhibited 31 use AC's—likewise more than 80% of all the cars produced in this country, exclusive of Ford, are factory equipped with AC Spark Plugs. The remaining 20% is divided among all the other spark plug makers of the world.

Dealers who have a good assortment of AC Spark Plugs can build a profitable business, as there is an assured demand for each type, due to their use as original factory equipment and backed up as they are by strong national advertising.

AC-SPHINX
Birmingham
ENGLAND

AC Spark Plug Company, FLINT, *Michigan*

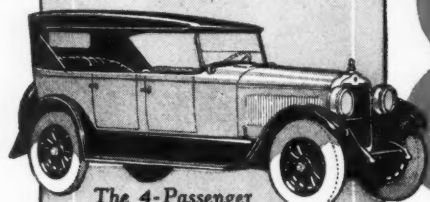
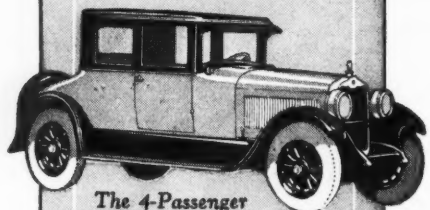
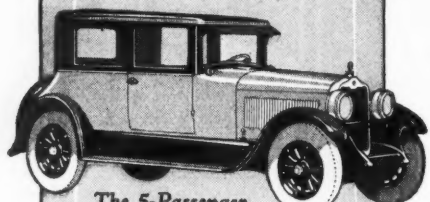
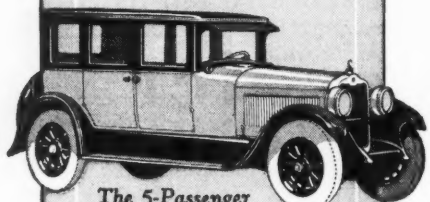
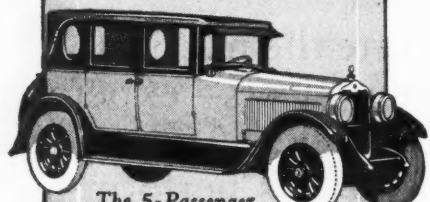
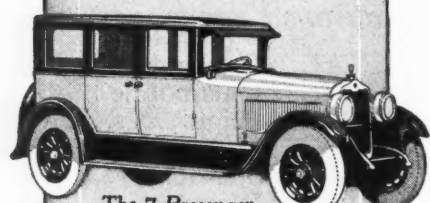
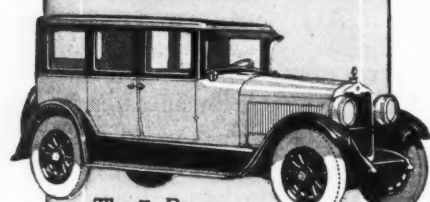
Makers of AC Spark Plugs—AC Speedometers

U. S. Pat. No. 1,135,727, April 13, 1915; U. S. Pat. No. 1,216,139, Feb. 13, 1917. Other Patents Pending

AC-OLEO
Levallois-Perret
FRANCE

The EQUIPOISED

8

You Can Meet
for Fine
This OneThe 4-Passenger
Touring PhaetonThe 4-Passenger
VictoriaThe 5-Passenger
CoupeThe 5-Passenger
SedanThe 5-Passenger
Town-BroughamThe 7-Passenger
Suburban SedanThe 7-Passenger
Berline Limousine

THINK what a franchise covering the Peerless line really means. Here are two distinct cars—each with a distinctive appeal to car buyers—and each the outstanding leader in its class.

The Equipoised Eight—a truly marvelous car—with a V-type, eight cylinder motor that is absolutely vibrationless at all speeds. A blend of brute power and gentle smoothness. Beauty that excites admiration. Performance that wins respect. Comfort—finish—completeness.

The Superb Six—"the best Six in the world regardless of price." A wealth of smooth, quiet power. Get-away that

PEER

The SUPERB

Any Demand Cars With Great Line

leaves the crowd behind. A masterpiece in design and riding ease.

Cars that not only sell, but that give satisfaction after they are sold.

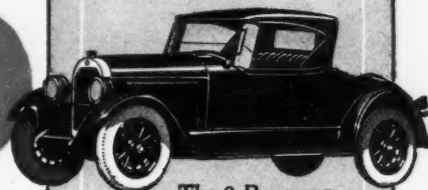
Cars built and backed by a manufacturing company of experience, permanence and stability.

Cars retailed under a selling agreement that allows an excellent profit on every sale.

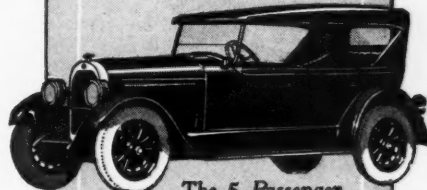
Can you think of any combination that would work harder for the success of a dealer or distributor? Write or wire for the Peerless proposition.

THE PEERLESS MOTOR CAR CO., CLEVELAND, OHIO
The Equipoised Eight and the Superb Peerless Six

LESS



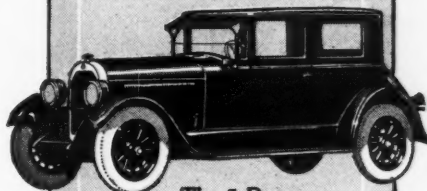
The 2-Passenger
Roadster



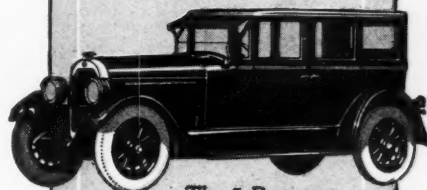
The 5-Passenger
Touring Phaeton



The 7-Passenger
Touring Phaeton



The 5-Passenger
Coupe



The 5-Passenger
Sedan



The 7-Passenger
Sedan



The 7-Passenger
Berline Limousine

Gaining in Sales Each Year!

SHALER Self-Merchandiser

Shows the vulcanizer, how easy it works, and the perfect repair it makes. It sells vulcanizers because it tells the whole story at a glance. Your jobber's salesman will tell you how to get it

FREE!

Sales records tell the story. Although there were millions of 5-Minute Vulcanizers in use at the end of 1922 (the sixth year on this model) 1923 sales showed a 46% increase over 1922. And 1924—which was not so good for many manufacturers—showed comparatively as big a gain over 1923.

A Big Sales Drive in '25

To make 1925 another sales record breaker for Shaler dealers—a bigger and more intensive advertising campaign than ever before. Dominating advertisements in the Saturday Evening Post and other national publications, motorists magazines and farm papers. More and better selling help for dealers. Think of the repeat business this will mean on Shaler Patch-&-Heat Units that motorists buy all the year 'round for use with the Vulcanizer.



Write Now for Free Sales Helps

Connect with our big sales drive in '25 and increase your profits. Feature the 5-Minute Vulcanizer. Take advantage of our co-operation. Use the display material, counter cards, circulars and other help that we are glad to send you.

The *Easiest* Way To Repair Punctures



Why It's Easy to Sell

One motorist tells another. Once sold on the idea of "Vulcanize First and Make It Last," he keeps right on using his Shaler and recommends it to his friends

The Shaler appeals to the motorist because he needs no gasoline, no shears or knife to cut a patch to fit—not even cement—to make a permanent tube repair quickly and easily when he gets stuck on the road.

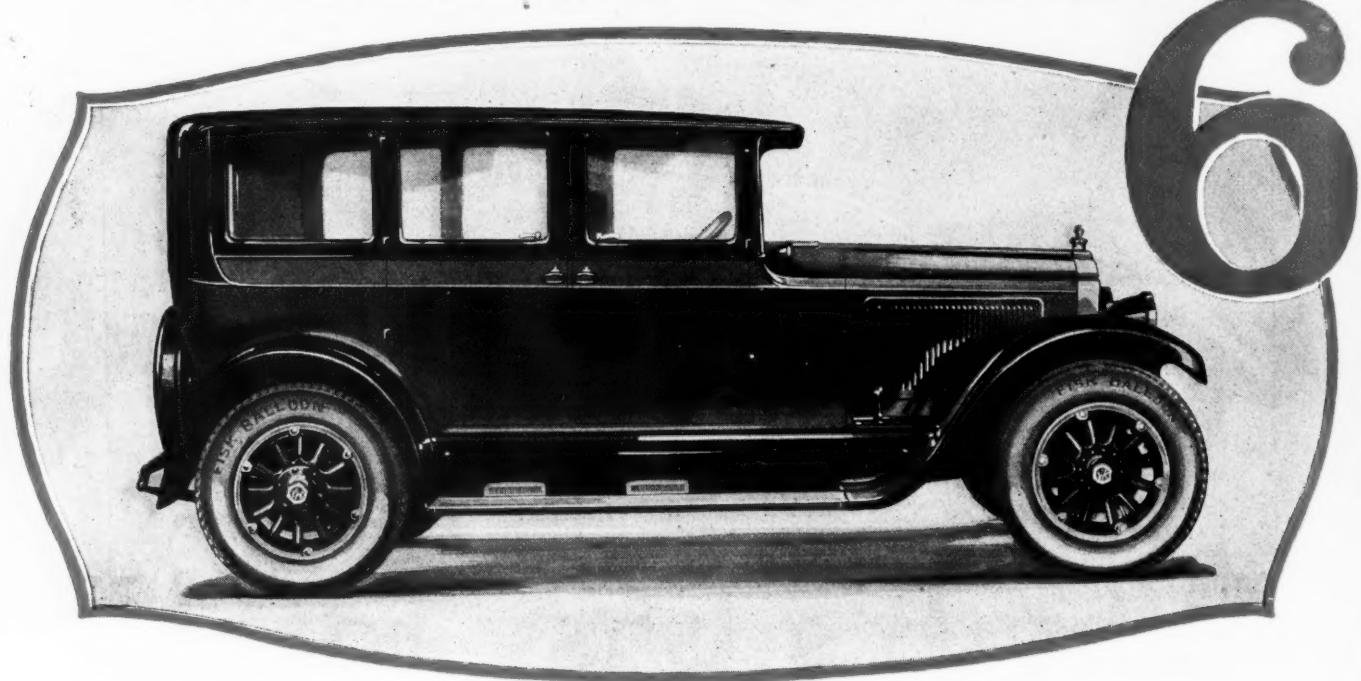
The Shaler Patch-&-Heat Unit is the secret. The motorist simply clamps one of these Units over the puncture, lights the solid fuel it contains, and waits five minutes. That's all there is to it. He gets a heat-vulcanized repair—just like the tire repair shop makes—when he's out on the road miles away from a town.

C. A. SHALER CO., 201 Fourth St., Waupun, Wis.

SHALER

5-MINUTE VULCANIZER

New!— WILLYS-KNIGHT



The Big Show

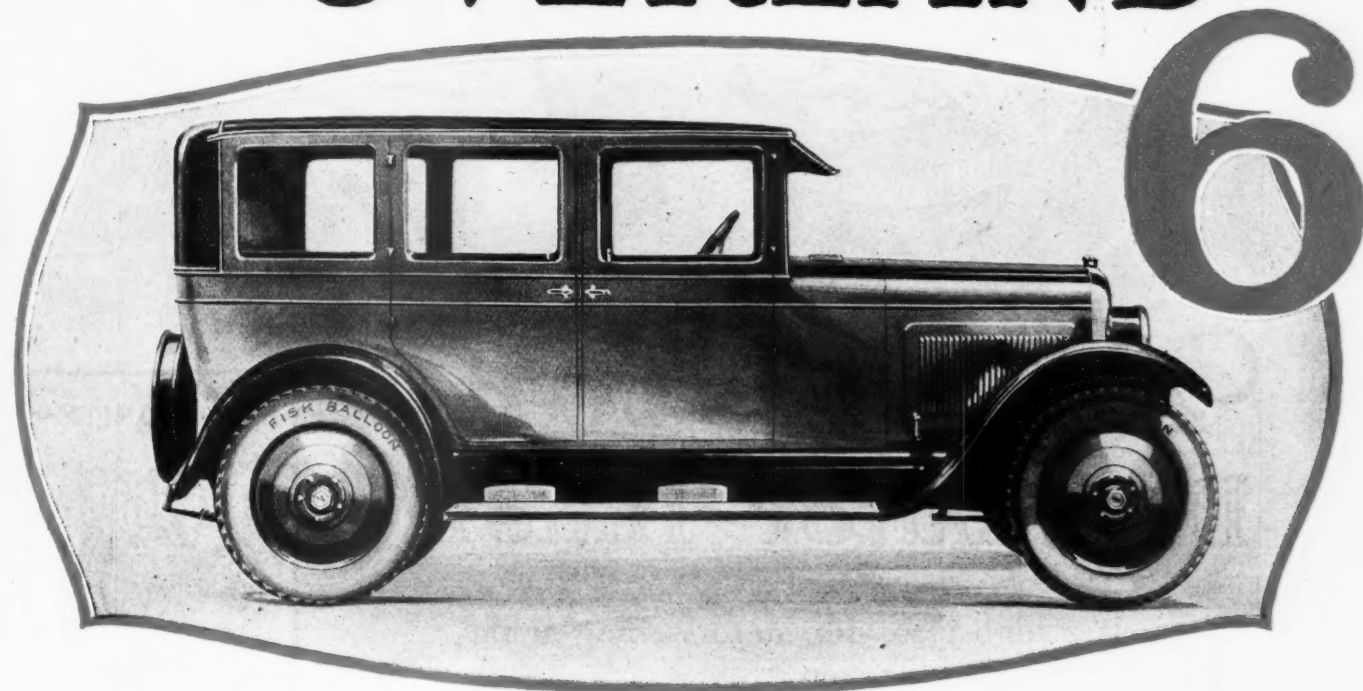
Willys-Overland is showing for the first time at the New York Automobile Show a Willys-Knight SIX—and an Overland SIX—two entirely new creations that will give Willys-Overland dealers the same strong position in the field of sixes as they now possess in the field of fours.

Fours and Sixes in Willys-Knights, and Fours and Sixes in Overlands—the most complete line of automobiles in the

WILLYS-OVERLAND, INC., TOLEDO, OHIO

WILLYS-

New!— OVERLAND



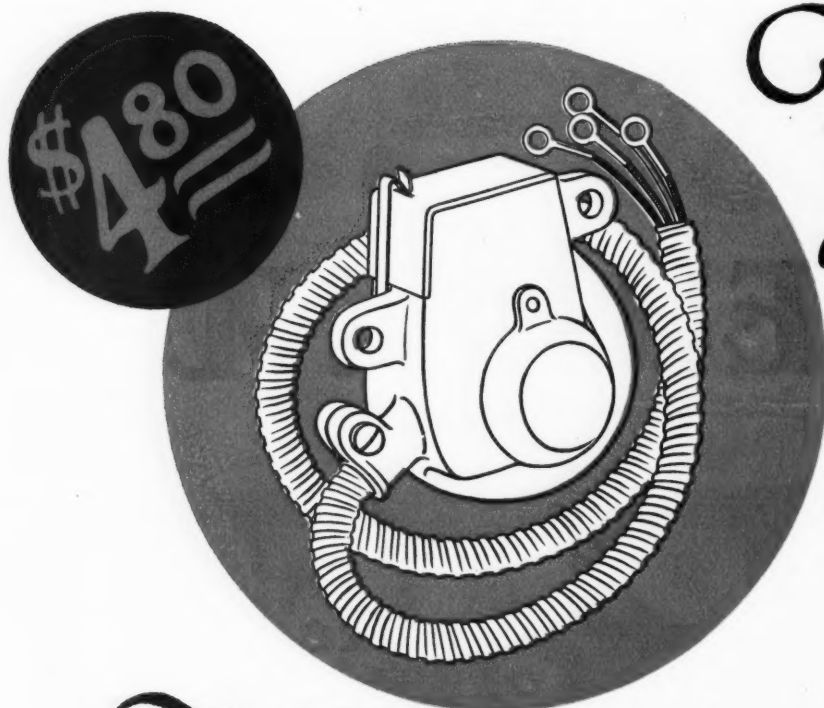
of the Big Show!

world under one franchise—the greatest range of prices and the greatest money-making scope ever offered to dealers.

See the Willys-Overland exhibit at the New York Show—or at the Chicago Show—and see what a showing you could make in your town with this truly great line. Write for the inside facts about the liberal terms and profit possibilities of the new Willys-Overland franchise.

WILLYS-OVERLAND SALES CO. LTD., TORONTO, CAN.

OVERLAND



*Here's
Something
NEW*

The Kingston L-T Distributor-Timer

Here is a high class distributor selling at the price of an ordinary timer.

Different in design and principle, handsome, splendidly made, it offers the dealer a year around seller on a highly profitable basis. There is a big waiting demand for a distributor of this high character.

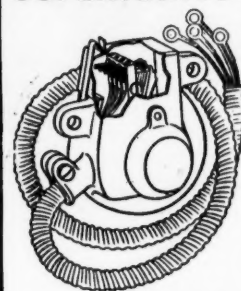
Four sets of adjustable contact points, extra large size; contact levers positive in operation; cables contained in flexible metal conduit; quadrate breaker cam (4 cams in one) of best tool steel; points solidly assembled in bakelite.

Let the KINGSTON lead your spring sales

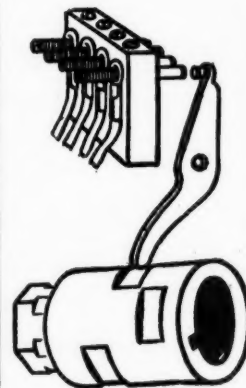


KINGSTON

Points of SUPERIORITY~

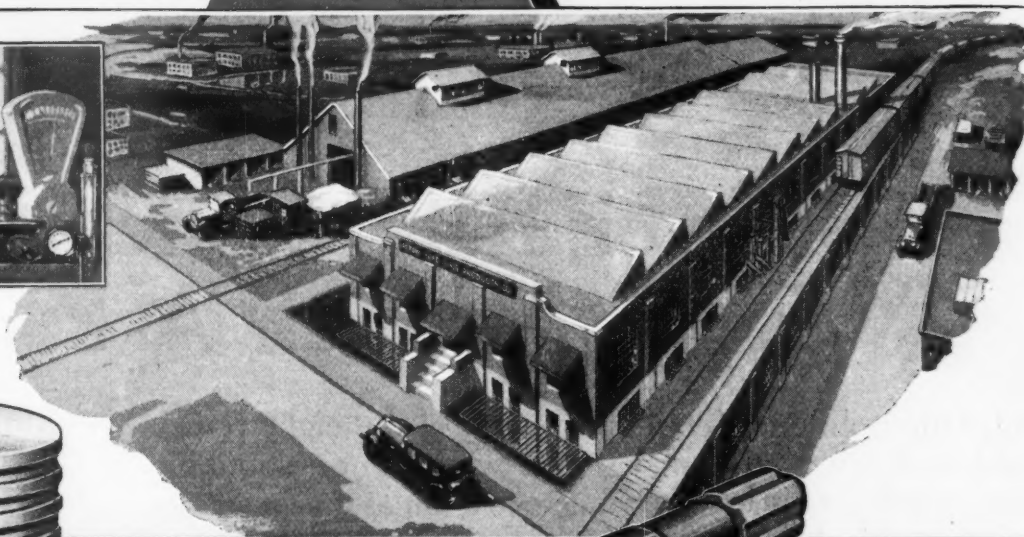
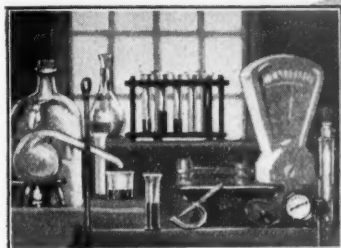


Case of aluminum Cables in flexible metal conduit.



Details of point assembly in block of bakelite fibre, with contact lever and quadrate cam. Points extra large and of best material. All parts quickly and easily replaceable.

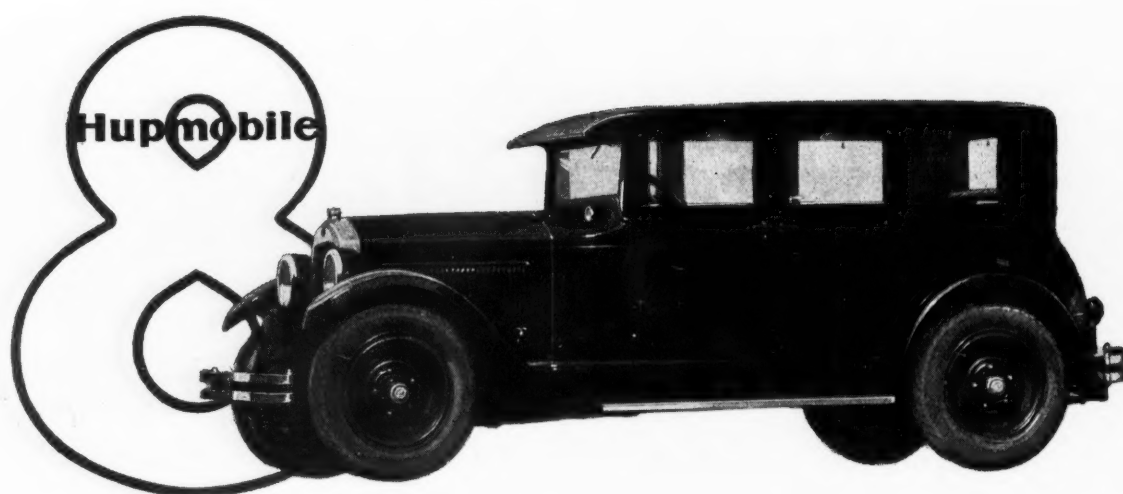
Arrow Head



By carrying metallurgical research farther, by adapting methods, processes, furnaces and equipment to a highly specialized line, unlimited resources have brought Arrow Head Pistons, Piston Pins and Shafts to a degree of perfection not heretofore known.

ARROW HEAD STEEL PRODUCTS COMPANY
MINNEAPOLIS, MINNESOTA
U. S. A.

Dependable Products



Never Before Such An Eight At Such A Price*

Only Hupmobile itself could build such an Eight, at a price which for the first time brings eight-cylinder motoring to the door of the average American family.

For Hupmobile now incorporates in its Eight a degree of economy and performing stability never before associated with the Eight as a type.

Here at last is an Eight with all the endurance and reliability which have made Hupmobile famous—

Plus superiorities of its own, over and above the super-

abilities of the eight principle, which unquestionably single it out as a new leader among American eights.

1 The shortest, most compact eight-in-line engine ever built.

2 More power per cubic inch of piston displacement than anything which has preceded it.

3 Performance is so smooth and symmetrical that there is not even a murmur of "roughness" anywhere in the engine's entire power and speed range.

4 More than any other fine car, it combines compactness for handling and parking with roominess for riding comfort.

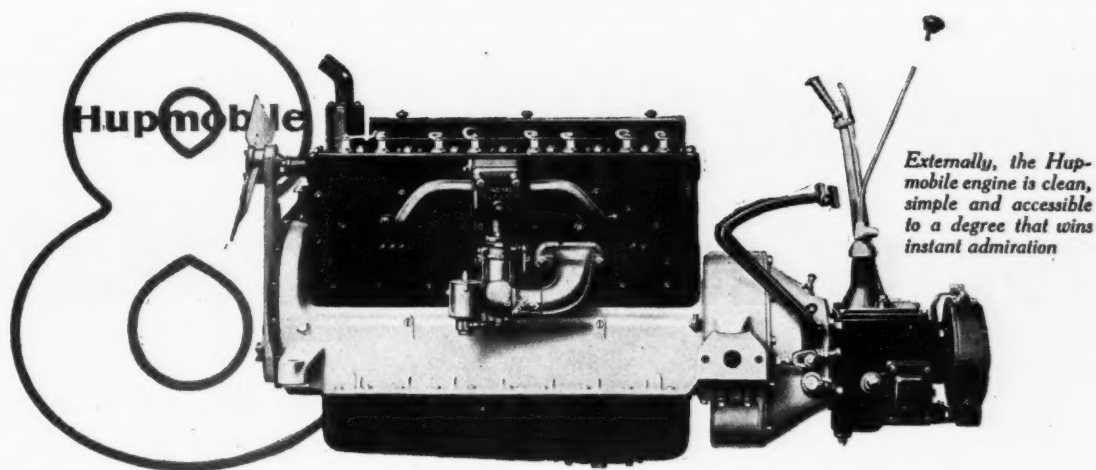
5 A finer and better balanced combination of speed, lugging power and rapid acceleration than the eight type has ever before presented.

6 An average gasoline economy heretofore unequalled among eights—

7 Beauty of design, finish and equipment not excelled within \$1,000 of its price; and its own price less than that of many sixes.

HUPMOBILE EIGHT





Externally, the Hupmobile engine is clean, simple and accessible to a degree that wins instant admiration.

Built As Only Hupmobile Would Build An Eight

Nearly two years of preparatory and development work have preceded this announcement of the Hupmobile Eight.

On a pound-for-pound basis, the Hupmobile Eight is being built and priced more economically than any comparable car.

The great compactness of the engine is possible because Hupmobile is using a crank-shaft of new design; and because at great cost Hupmobile has developed a new valve mechanism, based on aeronautic practice.

Short, balanced crank-shaft — heavy and stiff; light, rigid connecting rods; light pistons—these in themselves spell “no vibration.”

Accurately machining the en-

tire inside of every combustion chamber means uniform-sized combustion chambers—the same gas charges in all—the added smoothness of explosions of the same power in all cylinders.

Uniform temperature is maintained in all cylinders, and a thermostatic valve does not permit the water in the cylinder block to circulate until its temperature reaches 130 degrees.

The truth is that in engineering ingenuity and in performance—results, the Hupmobile Eight goes far beyond previous developments.

Some Mechanical Features
Lockheed hydraulic four-wheel

brakes.

Special six-ply balloon tires.
99½ pound balanced crank-shaft.

Light, rigid connecting rods; light pistons.

Machined combustion chambers, absolutely uniform in size. Airplane valve mechanism (rocker-tappet type).

Uniform temperature in all cylinders.

Thermostatic control of engine temperature.

**The price of the New Hupmobile Eight is undoubtedly the most attractive ever placed on such a car. The nearest Hupmobile dealer is now ready to give out complete price information.*

The New Hupmobile Eight is being exhibited at the New York, Chicago and other automobile shows, and at 600 Hupmobile showrooms throughout the country

HUPMOBILE EIGHT



Yellow Cab Offers Just what truck dealers The Truck

A complete line of trucks with custom-built bodies, embodying Yellow Cab stamina and low cost of operation, adaptable to 80% of all hauling requirements.

For the first time in history, a Yellow Cab truck selling franchise is available to dealers.

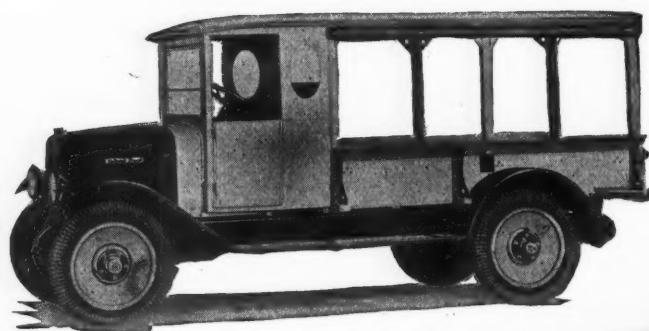
Think what it means to offer your customers not only vehicles proved by the world's largest and most profitable fleet operations, but the accumulated experience from billions of miles of actual performance.

Every thinking *truck buyer* recognizes what this means to him in decreased operating costs—

Every thinking *truck dealer* recognizes what this means to him in decreased operating costs—

Every thinking truck dealer recognizes what it means to him in *decreased sales resistance*.

And best of all, prices that meet and defeat competition.





have been wishing for~

The Plan

If you have the brains and the ability to sell trucks we will supply the capital.

Here is a way to sell a profitable line of trucks—with all the sting taken out, because

First: You see us instead of your banker. We have sufficient faith in our own truck and in our selection of dealers to finance our product on the dealer's floor.

Second: We also provide, without endorsement or recourse on the part of the dealer, a financing plan; again emphasizing our belief in our merchandising plan.

Third: Such advertising as we request a dealer to do, will be done in his own newspaper and over his signature, and will be paid for by ourselves.

Fourth: Our plan does not require excessive overhead and is truck selling reduced to its simplest form, where one sale or five hundred nets you a profit. We show you how to sell trucks without the losses incident to the trade-in practice.

Fifth: No free service under our plan—the dealer gets paid either by this company or by the customer for all service performed.

Sixth: A truck line complete with bodies—not only standard selections—but also a custom-built department, so that you may quote your customers on any type of vehicle for light delivery purposes.

Seventh: Your contact with this company affiliates you with a concern who, before they ask anyone to buy their product, try it in their own operations — the biggest in America—giving practical rather than theoretical advice to purchasers.

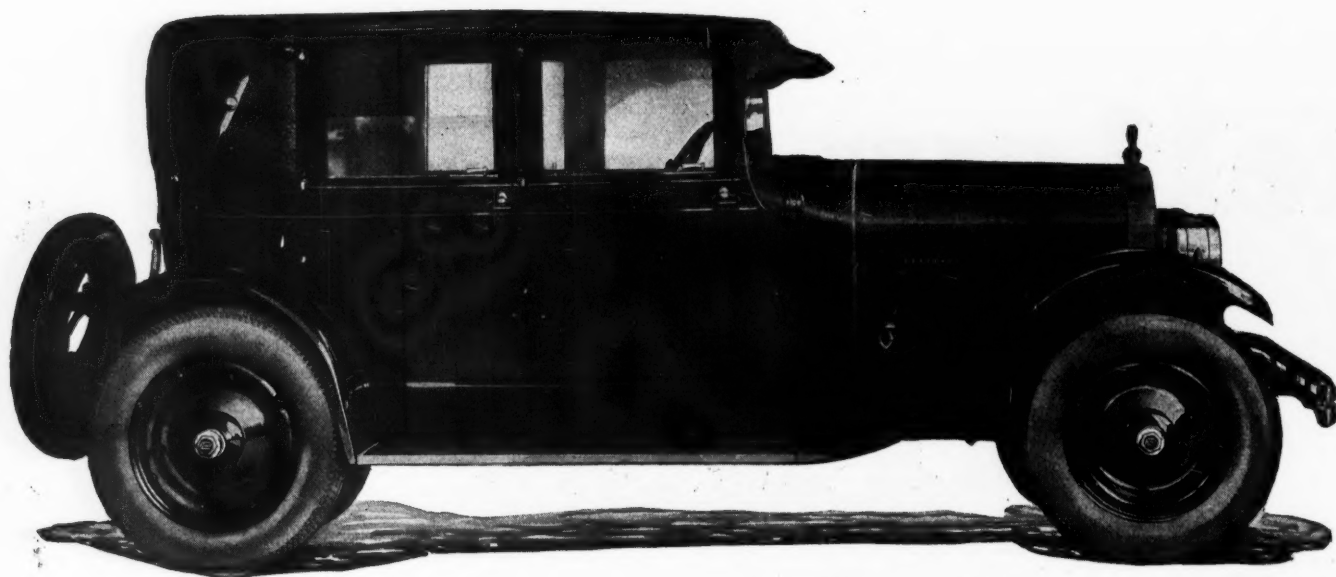
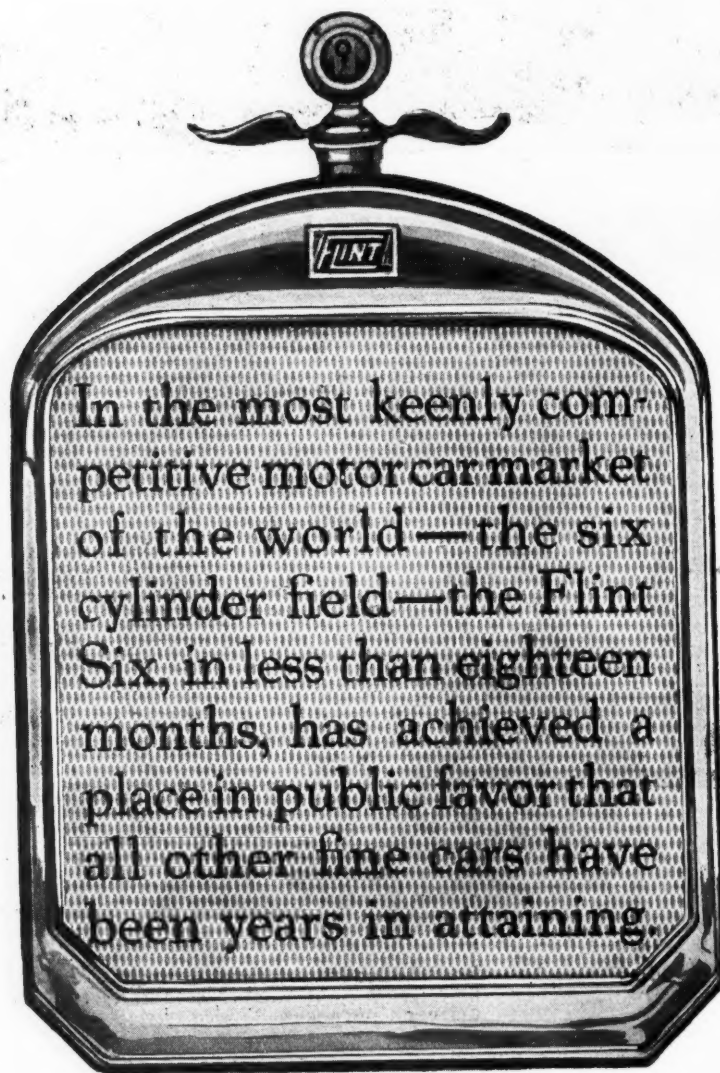
This is a cordial invitation to call on us at the New York Show and get complete details. You will find our representatives in sections 29 and 33, who will arrange to show you our complete line of trucks.

Yellow Cab Trucks

Yellow Cab Mfg. Sales Corp.
Chicago, Ill.

Yellow Cab Manufacturing Sales Corp.
Austin & Dickens Ave.
Chicago, Ill.
Send particulars on the "New Proposition for Dealers."

Name _____
Address _____
City _____
State _____



FLINT SIX



Watch the Flint in 1925

IN view of the achievements of the past twelve months, the Flint Six appeals to the progressive merchandiser.

Flint Six quality will be the most important sales factor of 1925, and . . .

. . . the new Flints, which include the latest in body designs and mechanical equipment, are as usual so far in advance that another sales record for 1925 is a certainty.

FLINT MOTOR COMPANY
FLINT, MICHIGAN

BUILDERS OF HIGH-GRADE MOTOR CARS

FLINT SIX



All Gabriel Snubbers look like this illustration and bear the name Gabriel Snubbers.

What Happens With Balloon or Low Pressure Tires?

When balloon or low-pressure tires encounter a bump, they yield to it because they contain a soft, springy cushion of air.

But they rebound as quickly and as surely as they yield—because they are soft and springy—and they pass this action on, through the car springs, to those in the car.

The exclusive Gabriel combination of increasing braking action and of free play is the answer to balloon tire requirements.

The one snubs and controls the greater upthrow of low air pressure and stops galloping and rolling. The other, by permitting the low air pressure to function properly on small bumps, keeps the shocks below the car springs.

They are the real reasons why you should sell Gabriel Balloon-Type Snubbers now. Write for details on the new sales proposition.

There isn't much air pressure in a toy balloon, but you know what a lively thing it is. You can't get your finger away faster than the balloon recovers after you have compressed it. Neither can the car spring get away from the reaction of the soft air cushion in a balloon or low-pressure tire, when the tire is depressed by striking a bump. Unless controlled, that spring action corresponds exactly to the tire action and must be passed on as an upthrow or a galloping motion to those in the car.

GABRIEL MANUFACTURING COMPANY

1415 East 40th Street, Cleveland, Ohio

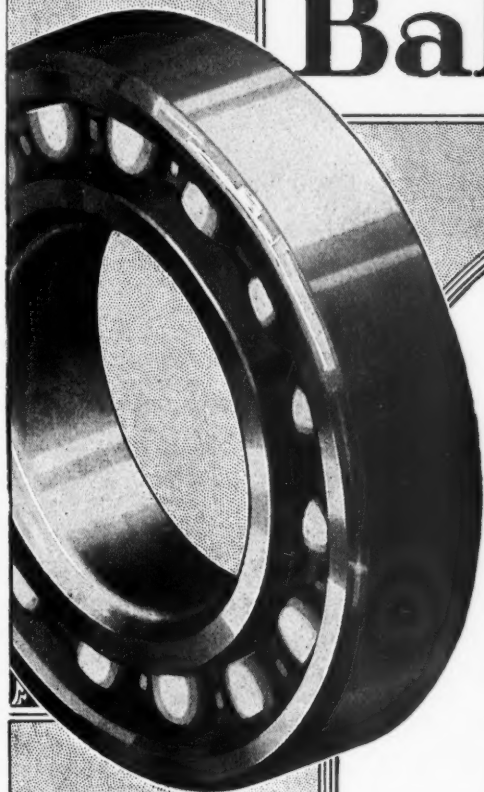
Gabriel Manufacturing Company of Canada, Toronto, Ont

☞ Sales & Service Everywhere ☞

Gabriel *Balloon Type* Snubbers

Best for All Tires Carrying Low Air Pressure

New Departure Ball Bearings



95% %

of American automobile builders have chosen New Departure Ball Bearings for their 1925 models. It would be difficult to offer more conclusive evidence of their confidence in the exquisite quality of this product and its ability to reduce friction and wear and increase the useful life of the automobile.

THE NEW DEPARTURE MANUFACTURING
COMPANY

Detroit BRISTOL, CONNECTICUT Chicago
56 Victoria St., London, S. W. 1, England

Ball Bearings Do Not Wear

Give 'em back the chance to brag!

You drive a car yourself. Don't you recall the wonderful sensation of snap in the get-away, reserve power, and flexibility in traffic that it gave you when it was new?

Don't you remember how you felt like bragging a little about it?

That's the thrill your customers want you to give back to them when they come in with battered, burned, and worn-out valves. And you can do it so easily, when valves are in such bad shape, by putting in new Thompson Silcrome Valves!

The average customer hasn't any particular affection for his old valves. What he wants is the old original pep and power. Nothing will give it to him so surely and permanently as new Thompson Silcrome Valves, which have no equal for resistance to burning, warping and wear.

Thompson Silcrome Valves are standard equipment in the finest cars and trucks, and in practically all airplanes, racing cars, and motorcycles. Leading jobbers carry them in stock for all makes and models—regular stems and oversize.

Order them by brand name, and give your customers a real chance to brag.

THOMPSON PRODUCTS, INC., CLEVELAND

Also Manufacturers of Tappets, King Bolts, Tie-Rod Bolts, Spring Bolts, Bushings and Starting Cranks

EXPORT DEPARTMENT: 130 West 42d St., New York, U. S. A.

CABLE ADDRESS: "THOMPRO—NEW YORK"





*Used for original equipment by
more than fifty leading automo-
tive builders, such as these:*

Autocar	Packard
Chrysler	Peerless
Curtiss Aeroplane	Rollin
Duesenberg	Sterling Engine
Franklin	Waukesha Motor
Harley-Davidson	Wills Sainte Claire
Marmon	Wright Aeronautical



Silcrome Valves

60¢

the new low price of

the same
Quality—
backed by
the same
guarantee of
at least
1,000 miles
per gallon of
oil



Now ALL sales resistance eliminated

The oil saving ability of the design of Sav-Oil rings, the uniformity of size and the lasting quality of the materials used have all been *proven* to the absolute satisfaction of thousands of car owners and garagemen.

At the new low price of 60c, the only sales resistance to Sav-Oil rings has been eliminated. No motorist would hesitate over that price—backed by the positive *guarantee* of at least 1,000 miles to the gallon of oil.

This exclusive Sav-Oil feature, with its proven merit and new low price, will make sales easy and satisfaction sure. In 1925 concentrate on Sav-Oil—a good ring for your cash register. Order now.

Territories Open for Distributors

The Sav-Oil Ring Mfg. Co.

1037 So. Figueroa St.

Los Angeles

Distributed by

Oregon Factory Agents
445 Burnside St.
Portland, Ore.

Sav-Oil Piston Ring Co.
2056 Jackson Blvd.
Chicago

Sav-Oil Ring Mfg. Co.
550 Golden Gate Ave.
San Francisco, Cal.

Mountjoy Bros.
733 W. Colfax
Denver, Colo.

H. W. Blevins
Box 275
Topeka, Kansas

C. H. Mountjoy & Co.
211 Third Street
San Antonio, Texas

OFF'N'ON CHAINS



Getting the Public Acquainted with a Big Idea

THE twenty-five million **OFF'N'ON** Tire Chain messages that are being sent to car owners through leading national magazines are doing a big job.

They are letting the public know that there is a tire chain that can be put on and taken off without tools, and that has cross links that can be attached or detached by hand.

Every day we get letters from magazine readers asking us where they can get **OFF'N'ON** Chains. These letters we turn over to dealers who are stocked.

Get your share of this business. **OFF'N'ON** Chains in regular and balloon sizes.

PYRENE MANUFACTURING COMPANY

Newark, New Jersey

CHICAGO ATLANTA KANSAS CITY SAN FRANCISCO

Makes Safety Certain

Makers of Pyrene Fire Extinguishers

NEW ISSUE

THIS STOCK HAS BEEN OVER-SUBSCRIBED

400,000 Shares

Briggs Manufacturing Company*This stock is being bought from individuals and involves no new financing for the Company*

Stock Without Par Value

Capitalization

Stock (without Par Value)	To be Authorized	To be Outstanding
(100 shares Common Stock, par value \$10 each, issued in conformity with Michigan law and held in Treasury.)	2,025,000 shares	2,000,000 shares

No Funded Debt—No Bank Loans—No Preferred Stock*Mr. Walter O. Briggs, President of the Company, summarizes his letter to Bankers, as follows:*History and Business

Started in 1909 with a cash investment of \$50,000 and earnings of \$90,000, the Briggs Manufacturing Company has always shown a consistent and increasing earning power and a substantial profit in every year since it started in business. Today the net earning power is over \$11,000,000 a year, and net tangible assets are in excess of \$23,000,000. This growth in assets has been financed mainly out of earnings.

In 1919, foreseeing the growing importance of closed automobile bodies, the original business of painting and trimming was expanded to the production of complete bodies. Through specialization in this field the Company has become the largest closed body manufacturer in the world.

In 1923, the Michigan Stamping Company was acquired to round out the business and effect economies in operation. This Company had never had a losing year from its incorporation in 1911. This acquisition provided the Briggs Manufacturing Company with one of the largest and best equipped pressed steel plants in the country.

Earnings

Development of earning power in recent years of the Briggs Manufacturing Company and the Michigan Stamping Company combined is shown by the following table prepared by Messrs. Ernst & Ernst:

Year	Net after Taxes
1920	\$1,697,036.68
1921	2,773,647.51
1922	4,715,669.60
1923	6,847,490.19
1924 (December estimated)	11,107,096.32

All income taxes figured at present rates.

The volume of business in 1925 should approximate \$125,000,000.

Financial Condition

The Balance Sheet of September 30, 1924, as certified to by Messrs. Ernst & Ernst, Public Accountants, shows net tangible assets of \$23,143,902.67. Current assets amount to \$18,737,585.54, of which \$9,054,425.08 are cash and call loans. Current liabilities are \$5,854,399.66. The Company's statement includes no value for the goodwill which has been built up over a period of years.

Dividend Policy

The Company has paid cash dividends in every year except one since 1911. The Directors plan to place the new Shares without par value on a \$3.50 annual dividend basis, payable quarterly, commencing in January, 1925.

Management

The management of the Company continues in the hands of those who have been in active charge of operations and have been responsible for its rapid growth in recent years. Mr. Walter O. Briggs will continue to manage and direct the affairs of the Company as in the past and will retain a large financial interest.

The Company will make application to list this Stock on the New York Stock Exchange.

Legal proceedings—Messrs. Beekman, Bogue, Clark & Griscom and Messrs. Wing & Russell, of New York, for the Bankers; Messrs. Beaumont, Smith & Harris, of Detroit for the Company. Auditors—Messrs. Ernst & Ernst. Appraisals—Manufacturers' Appraisal Co.

We offer this stock "when, as, and if issued and received by us" and subject to the approval of counsel. Pending the issue of definitive stock certificates by the Company there will be issued interim receipts or temporary certificates exchangeable for definitive stock certificates when issued.

Price \$39 per Share**Merrill, Lynch & Co.****J. & W. Seligman & Co.****Hallgarten & Co.****Hornblower & Weeks****Dominick & Dominick**

The statements presented in this advertisement, while not guaranteed by us, are obtained from sources which we believe reliable and on which we have acted in the purchase of these securities.

2 big features

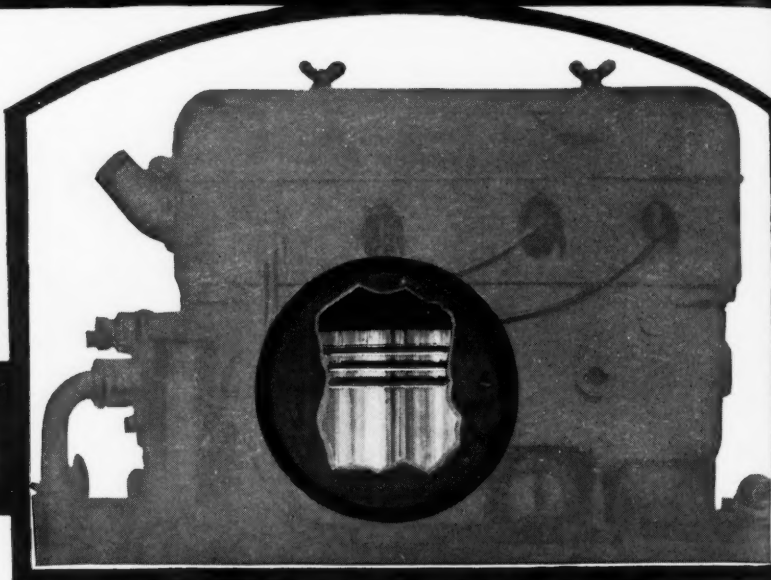


Bronseal **Piston Rings**

see
next
page

no 1 Bronze

no 2 1/16" Units



A better bearing and a better packing

BRONSEAL Rings are made of rolled phosphor bronze, mechanically tempered. The following advantages are therefore assured:

1. *A better bearing*, because they are made of bronze.
2. *Uniform tension*, because they are mechanically tempered. Rolled Bronze retains its tension under extreme heat conditions. It will not "go soft."
3. *Longer life*, because friction is reduced to a minimum.
4. *Better conformation to worn cylinder walls*, because bronze is resilient. Bronseal Rings will not break, rust or score. Bronze is a seven times better conductor of heat than any metal now used in the manufacture of piston rings.

Cut your stock in half

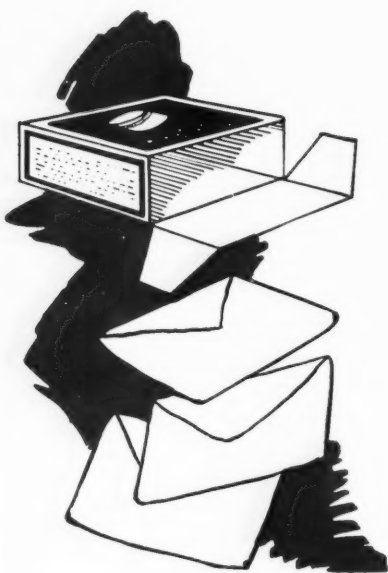
Practically all piston grooves are made in multiples of 1/16". Thus the jobber and the dealer stock Bronseals by diameters only. You can forget the groove width in ordering Bronseals. A stock of Bronseal Rings is 1/3 the size of ordinary piston ring stocks. Yet it will service every type of motor built. Think what that means to you in dollars and cents invested.

A perfect Packing

Each Bronseal Ring is 1/16" wide and each ring works independently of every other ring—whether 2, 3, or 4 are used—in the piston groove. In a 3/16"-groove, for instance, the Bronseal packing has three chances of holding the seal as compared to one of any other type of ring. Thus, Bronseals form a positive packing against oil and compression leakage, and crank case dilution.

Mail the attached coupon and we'll tell you about the most profitable merchandising plan in the automotive replacement field.

FEDDERS MFG. CO., Inc.
Piston Ring Division
BUFFALO, N. Y.



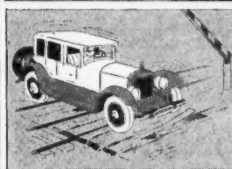
No loose rings in a Bronseal stock! Each carton holds 3 envelopes containing 8 rings. With only 2 exceptions you can service every motor without breaking a package.

Bronseal Piston Rings

FEDDERS MFG. CO., Inc.
Dept. M-1, Buffalo, N. Y.

Please send me information about Bronseal Rings, also your merchandising plan.

Name.....
Address.....
City.....
State.....
Zip.....



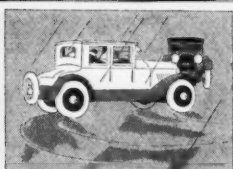
The series of sledge-hammer blows crossing over the railroad tracks



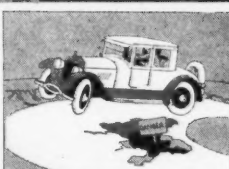
Gravity pulling forward—brakes holding back—a terrible strain



The attached lug which marks a safer wheel



Catapulted from a straight line into a skid—terrific sidetrain



Unexpected danger—only safe wheels can save the situation

Wheels Must Be Safe!

Twisting, bounding, swaying, skidding—strain, strain, strain—that is the treatment a wheel must stand; *must survive*. . . To question the importance of safe wheels is to question the importance of life itself. There is only one way to make wheels safe, that is to make them well, as Hayes Wheels are made. Each spoke of the wood wheel is stiffened by special reinforcement at the hub, held solid and true by a steel fellow. . . . The attached lug gives additional assurance that the rim cannot squeak, slip or come off and

saves one-half the ordinary time required in making tire changes. . . And should any further assurance of safety or quality be necessary, it is evidenced by the fact that in 16 years 35,000,000 Hayes Wheels have been placed in service. Those whose judgment prompts them to "look under the hood" should "look under the fenders." Find the Hayes Wheel with the famous attached lug rim. Find the name *Hayes* on the rim. That denotes the genuine.

HAYES WHEEL COMPANY, Manufacturers, Jackson, Michigan

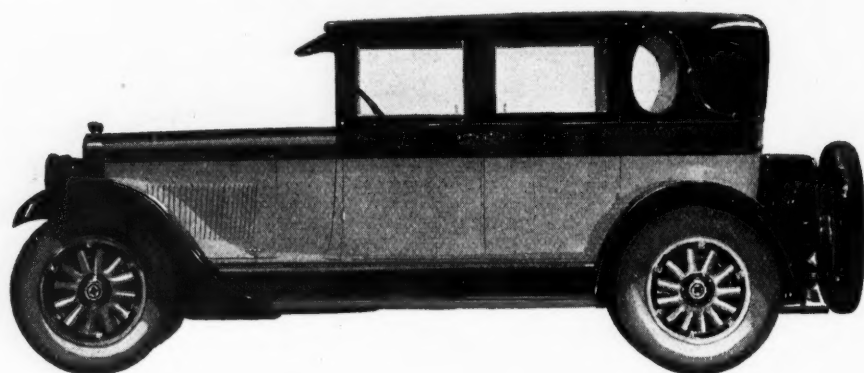
Factories: Jackson, Albion, Flint, St. Johns, Mich.; Anderson, Ind.; Nashville, Tenn. Canadian Plants: Chatham and Merriton, Ont.
Export Office: 30 Water Street, New York City

HAYES WHEELS

WITH ATTACHED LUG RIMS ~ STANDARDIZED IN WOOD, WIRE AND DISC

Rickenbacker

A • CAR • WORTHY • OF • ITS • NAME



Again!

One of the most advanced things you will see in this year's shows will be exhibited in the Rickenbacker booth.

—This time, in Body-craft—

A 4-Door, Coach Brougham mounted on the improved *Rickenbacker Six Chassis* and priced same as the former open models—\$1,595.

Here is the first 4-Door, Coach Brougham model yet shown.

See it; Examine its construction—it represents a signal advance in automobile body-building.

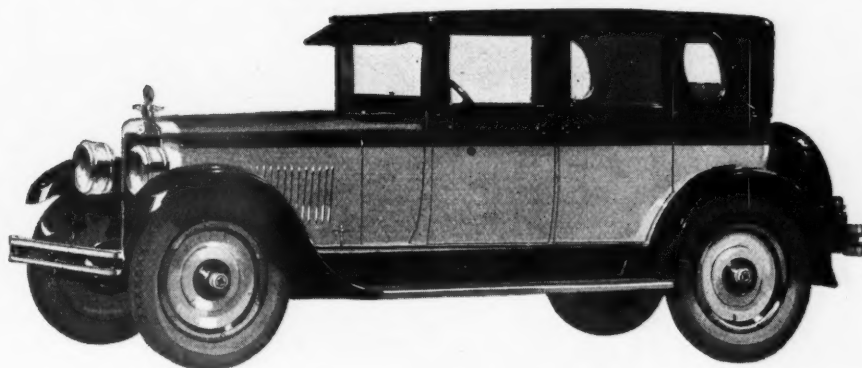
\$200.00 Reductions in prices of other six-cylinder models—Phaeton, Coupe and Sedan are also effective January first.

Rickenbacker Motor Company
Detroit, Michigan



Rickenbacker

A • CAR • WORTHY • OF • ITS • NAME



—And—in the same booth—

You will see that other sensation—the Rickenbacker *4-Door Brougham*—mounted on the “Vertical-8-Superfine” chassis—\$2,395.

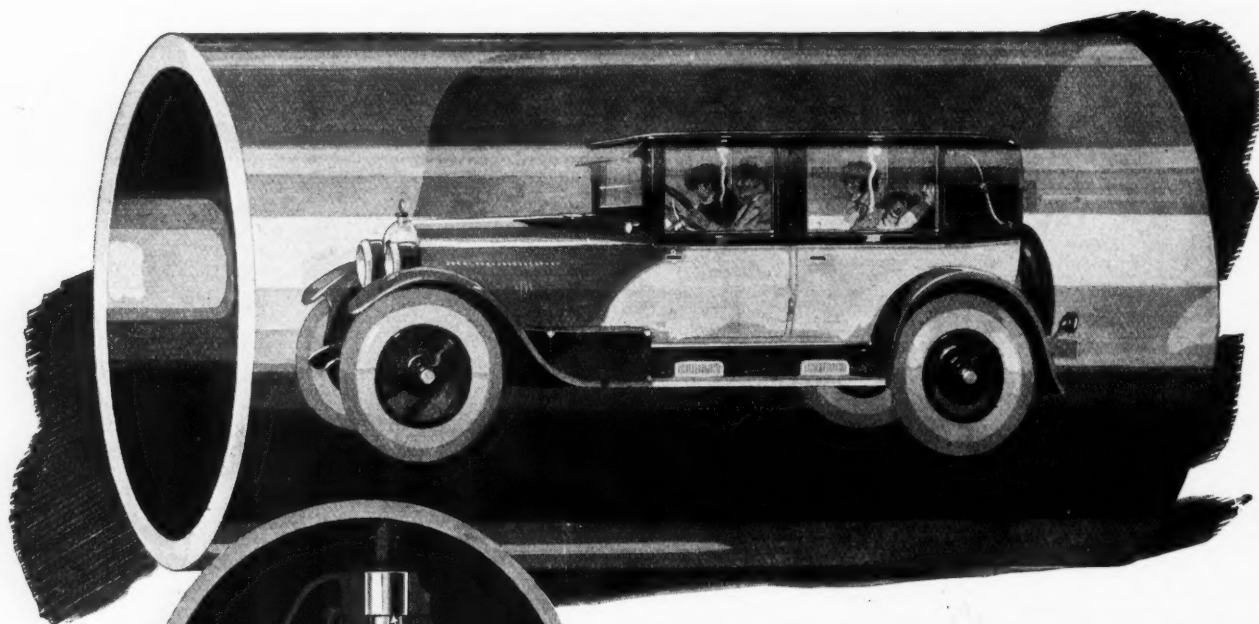
Here is a model that will excite your admiration and a price which will make you wonder how it can be done.

Consider what it will mean to you if you can secure the privilege of offering these two leaders—and all the other models in this matchless Rickenbacker line—to your own customers during the coming year—which will be a banner year.

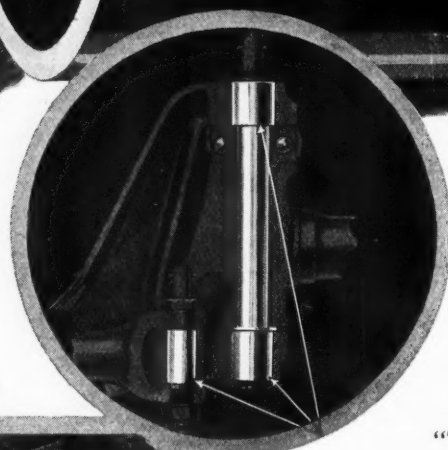
Get started right for a long stretch of easy going that is just ahead!

Rickenbacker Motor Company
Detroit, Michigan

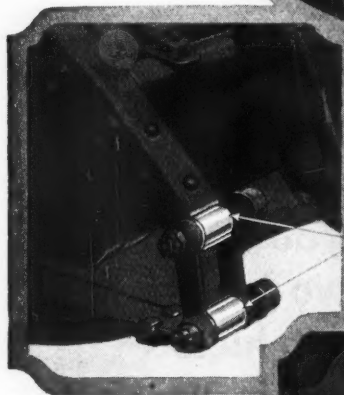




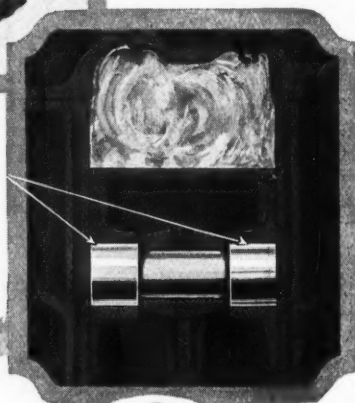
In the
Steering
Assembly



In the Springs



In the Pistons



"Many Little Rattles
Make a Big Smash"
—Baby Bunting.



THEY PROTECT AND LENGTHEN THE LIFE OF THE CAR

Every car dealer and service man can profit by the example of this prosperous Middle West car dealer. He has about solved his used car problem with Bunting Bushing Bearings.

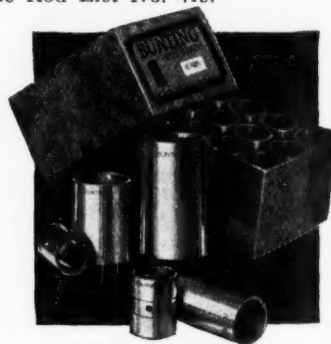
"The first thing that we do to a 'trade in' is to replace the worn bushings with Bunting Phosphor Bronze," he says, "especially in pistons, shackle bolts and steering assembly."

"We get a smooth running, silent car invariably. It shows up well in demonstrations and it stands up well in the hands of its new owner. Nothing else that we can do adds more to the salability and value. The cost is mighty small compared to the benefits."

Where shock and friction pound away at the vitals of the car the durability of Bunting Phosphor Bronze Bushing Bearings constitutes the best insurance obtainable. Your time and labor are invested to the best advantage of yourself and the car owner when you employ only Bunting quality for replacement. Leading jobbers have complete stocks. Complete specifications and prices are shown on Piston Pin Bushing List No. 18, Spring Eye and Shackle Bolt Bushing List No. 111, Steering Knuckle and Tie Rod List No. 415.

THE BUNTING BRASS & BRONZE CO., Toledo, Ohio

BRANCHES AND WAREHOUSES AT
 New York 245 W. 54th St. Columbus 7528
 Cleveland 710 St. Clair Ave., N.E. Main 5991
 Chicago 722 S. Michigan Ave. Wabash 9153
 Philadelphia 1330 Arch St. Spruce 5296
 San Francisco 198 Second St. Douglas 6245
 Boston 36 Oliver St. Main 8488



Neatly Packaged
in Marked Cartons

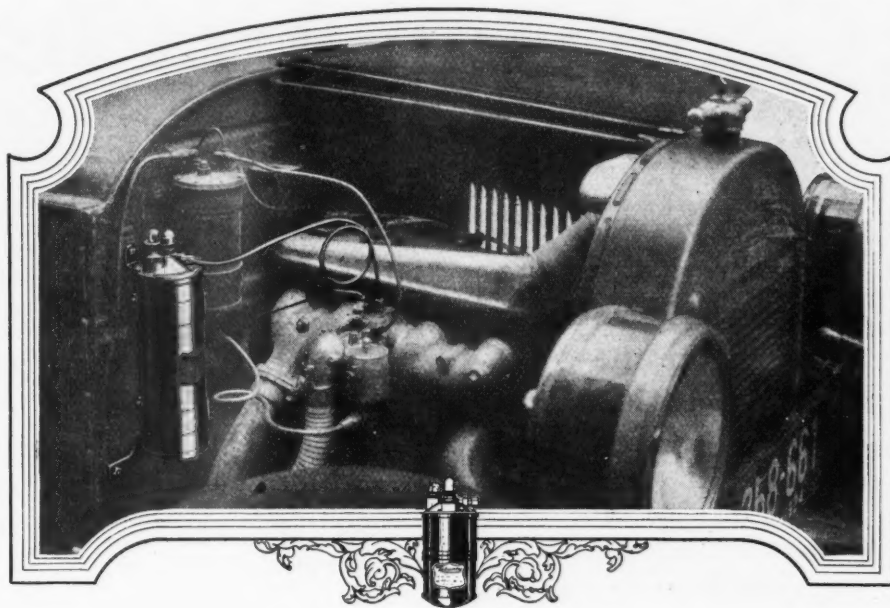
BUNTING

PHOSPHOR BRONZE

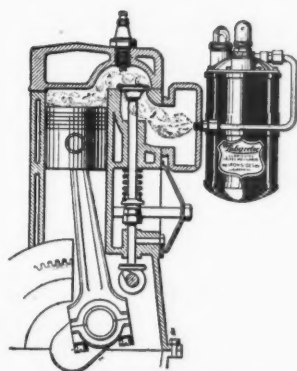
BUSHING BEARINGS

PATENTED

AN INTRODUCTION TO THE AUTOMOTIVE INDUSTRY



For Installation on Every Motor



THE LUBURETOR
PRINCIPLE

The Luburetor principle includes provision for an independent supply of oil and its introduction through the intake manifold into the combustion chamber, as shown above.

Accurate regulation of the feed to correspond with engine load and speed is provided by a rugged piston valve in the Luburetor, which is operated by vacuum. The Luburetor requires no service and will outlast the engine itself.

THE benefits derived from "Top-end" lubrication — the direct introduction of suitable oil through the intake manifold into the combustion chamber — are so pronounced that the Luburetor, which makes "top-end" lubrication practicable, is an essential improvement on every engine.

Long engine life, economical service uninterrupted by the necessity for frequent attention, smooth operation, maintenance of maximum power, are some of the advantages afforded by the Luburetor. Such benefits are important to every owner of an automotive vehicle—truck, tractor or passenger car—irrespective of price, type or model.

From the dealer's standpoint, the Luburetor presents sales possibilities limited only by the total motor registration. One universal model is applicable to every make of engine, which means a compact stock and, therefore, a limited investment.

A complete description of the Luburetor, sales plan, discounts, etc., may be had by substantial dealers and distributors upon request. We are rapidly completing a national distributing organization. Write or wire for Luburetor Folder No. 10 L.

THE LUBURETOR COMPANY
471 EAST BROAD STREET, COLUMBUS, OHIO

The Luburetor

TRADE MARK REG.

FOR ALL PASSENGER CARS, TRUCKS AND TRACTORS

What Good is an Air Cleaner?

It depends entirely on the kind

AN air cleaner that removes 99.9% of the road dust from the air supply to the carbureter and motor will actually reduce the normal wear on the vital parts of a motor from 75% to 90%, and reduce carbon formation from 50% to 75%.

An air cleaner that removes less than 90% of the road dust, and permits the finer particles of grit to enter the motor will not make much difference in wear or carbon formation.

The coarser particles are blown out with the exhaust. It is the smaller particles that adhere to the oil film on the

cylinder walls, and make the oil supply gritty.

The PROTECTOMOTOR is 99.9% efficient, has no moving parts to get out of order. It functions perfectly at all motor speeds. Its use as equipment by manufacturers reflects credit on the engineering department, and evidences honesty of purpose.

Extravagant claims are being made for other devices. Careful tests by many Engineering Schools and Universities have shown that PROTECTOMOTOR stands out for its efficiency. Write for report of tests made at the University of California.

Seeing is Believing

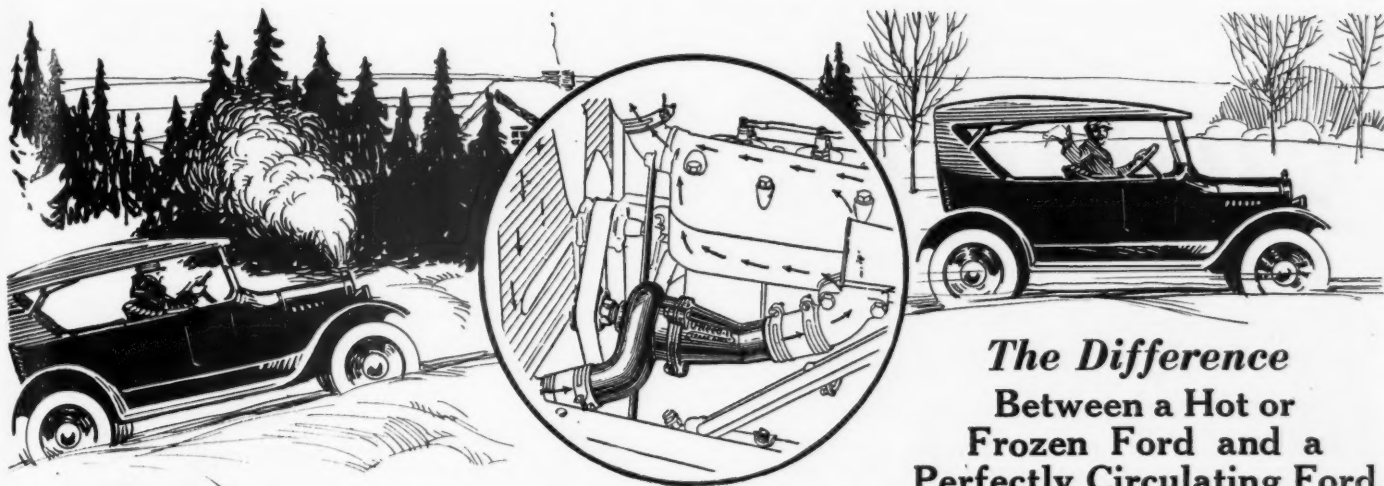
Connect the outlet of the ordinary cleaner to the intake of the PROTECTOMOTOR. Feed into the device road dust, sand, or grit. It will be readily observed that a considerable part of such material will pass through the ordinary separator and be caught by the PROTECTOMOTOR. Moreover it will be seen that some of these devices do not function at all at low speeds.

The PROTECTOMOTOR costs more to buy for the reason that it costs more to make. It is designed to perform a real service, not merely to sell at a cheap price.

You cannot do more to make your machine stand up in service than to adopt and recommend the PROTECTOMOTOR. Can you afford to do less?

STAYNEW FILTER CORPORATION
ROCHESTER, NEW YORK

A Motor Without a Protectomotor Is Like a Watch Without a Case



**The Difference
Between a Hot or
Frozen Ford and a
Perfectly Circulating Ford**

**One Model for
all Ford Cars and
Trucks**

The Good Points—

1. Self-centering, self-lubricating, phosphorous bronze bearing.
2. Rotary, with large opening between blade so that water continues to circulate if belt should break.
3. Long self-lubricating phosphorous bronze bearing.
4. Extra large brass packing nut.
5. Cold rolled special 1/2-inch steel shaft.
6. Adjustable pulley for aligning to any model Ford Car.
7. Bracket that rests inside of water manifold.
- 8-9. Flat steel support bolted to top hose connection and rests on crank case.

LIST

\$650

West of Rockies, \$7.00

U-Need-It

ROTARY PUMP FOR FORDS

HAS DOMINATING SELLING FEATURES—

A pump that will give a positive flow of water at all speeds of the Ford motor—that will pump the water at any level—that is easily installed without any changes aside from removing the lower pipe.

U-NEED-IT is THE pump that really pumps—not just an impelling pump but a “Compelling” pump—that will not cause belt slippage—and that will not interfere with circulation should belt break.

U-NEED-IT saves alcohol in cold weather because of the perfect temperature at which the solution is kept. Prevents freezing because of the constant flow of the water while engine is running. U-NEED-IT DOES NOT bolt onto the side of the block—but merely takes the place of the pipe—using the same hose connections and does not interfere with any other attachments.

Runs with a loose belt, NOT A TIGHT BELT.

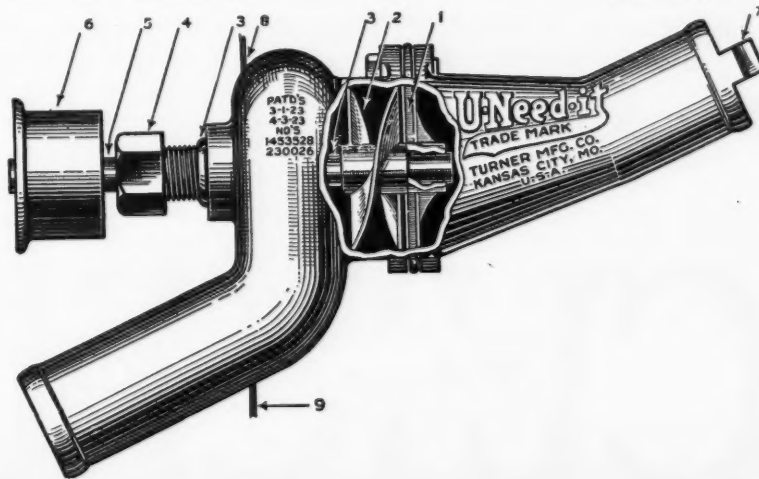
Note the NINE engineering points and learn why U-NEED-IT Rotary Pump for Fords is THE PUMP for greatest sales volume.

Attractive Jobber and Dealer discounts.

THE TURNER MANUFACTURING CO.

31st and Roanoke Rd.

Kansas City, Mo.





Skyline of Tampa, taken from a turret of the famous Tampa Bay Hotel, showing a portion of Plant Park, the Hillsborough River and section of the retail business district.

Curtis Air Compressors

in Florida

FLORIDA—sunny playland of America—with its surpassing climate, scenic beauty and aggressive spirit, is naturally accustomed to the best of everything. It leads the United States in many divisions of horticulture, leads the world in grape fruit production and ships more phosphate than any other state in the Union.

Florida has more than 182,000 motorists. Living in a superior environment, they expect superior service—that is why so many Florida garages and service stations are Curtis equipped.

Curtis means "lifetime" service. Back of every Curtis Compressor is 71 years of successful manufacturing experience, 28 of which have been devoted to the design and production of air compressors and related pneumatic machinery. Judging the future by the past, every buyer of a Curtis Compressor can feel definitely satisfied that he is getting a worthy product of experience and that his compressor is not likely to become an "orphan."

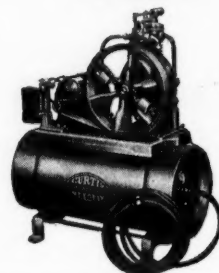
For complete information on the entire line of Curtis Single and Two-stage Air Compressors and Air and Water Stands—mail the coupon.

CURTIS PNEUMATIC MACHINERY CO.
1527 Kienlen Ave. St. Louis, U. S. A.
Branch Office: 530-H Hudson Terminal, New York City

CURTIS

1854 ^{71st} ANNIVERSARY 1925

CURTIS
AIR COMPRESSORS—HOISTS—TROLLEYS—CRANES
ST. LOUIS



CURTIS FEATURES

Controlled splash oiling system enables compressor to run longer on same amount of oil. Fan fly-wheel helps cool cylinders and increases efficiency. Valves light, large, inspectable. Head removable without loosening pipe connections. Hand unloader (or centrifugal on automatic outfits) permits starting unloaded against full tank pressure. No spitting of oil when the Curtis Automatic cuts out. Curtis two-stage has copper intercooler, the most efficient metal for this purpose. Many other features.



The New Curtis Air and Water Stand

Column or low type. Free of all complicated parts—entirely different in design and construction from ordinary stands. Many exclusive features.

CURTIS
PNEUMATIC
MACHINERY CO.
1527 Kienlen Ave.
ST. LOUIS, MO.

Gentlemen:—Please send me full details on Curtis Air Compressors, your proposition and prices.

Name.....

Address.....

Jobber's Name.....

Address.....

GATES BELTS

"The Standardized Fan Belt"

Can you think of a better recommendation for a fan belt than just to say "Gates Vulco Belts have outsold all other kinds of fan belts for 8 consecutive years?"

Made by the World's Largest
Manufacturers of Fan Belts.

ROLLIN

Announcing A New Series of Smart, Swagger Body Designs

Q During the past year Rollin has enjoyed unusual success and can point with pride to thousands of satisfied owners. Q Now, recognized as being among the foremost cars from a mechanical standpoint, Rollin announces another revolutionary development. Q A charming new series of voguish body designs in which are incorporated the prevailing style tendencies of custom made models, is now ready for your inspection. Q The latest Rollins are finished in those swagger two-tone color schemes. Q To be exhibited at the forthcoming New York and Chicago Automobile Shows, as well as at all other Shows of importance.

THE ROLLIN MOTORS COMPANY
CLEVELAND, OHIO

Designed by Rollin White

4-Wheel Brakes
Full-Size Balloon Tires
European Type Motor
4-Bearing Crankshaft
Force-Feed Lubrication
25 to 30 miles per gallon of gas



The New Series

Five Passenger Touring Car, \$1155
Three Seated Coupe Roadster, 1325
Five Passenger Brougham, • 1325
Five Passenger Sedan • • 1455

THESE Self-Closing Repair Links repair broken cross chains in 10 seconds, stop the clanking, save the fender. Can be attached by a child. Popular with all motorists because a box of 10 Flower City Self-Closing Links sells for 25 cents.

No tools needed to install one of these links. The illustrations tell the story—just slip the link into the loose ends of broken chain, hop in the car and drive away. On the first turn of the wheel the weight of the car closes the link and locks it. Can't close improperly, however hooked together—always makes a perfect connecting link that does not chafe the tire.

There's a real need for these links wherever cars are used. Every motorist should have a box in his car. The discount makes the profit worth while! Sales and advertising display material furnished. Distributors, Salesmen, Dealers, Jobbers, write for liberal proposition.

Flower City Specialty Co.

250 Mill St.

Rochester, N. Y.



**Packed and Priced
for Rapid Sale.**

Package of 10 Links—List Price 25 cents.
Display Carton of 20 Packages—List Price \$5.00.
Case Containing 6 Cartons—List Price \$30.00.

A 10 Second Chain Repair— No Tools



Hook the Self-Closing Link into two broken ends of cross chain—drive off.

First turn of the wheel closes and locks the Link.



The Flower City
Self-Closing Link
 Repairs Broken Chains

They're Electrically Welded *by an Exclusive Process*



REPEATED tests have shown that the bond between head and stem of a Toledo Standardized Valve is as indestructible as though the entire valve were forged from one piece.

No amount of pounding in the motor or in a vise will loosen the head from the stem. You tear the stem apart before you can tear the head from the stem.

This exclusive electric welding process makes the Toledo Standardized Valve today the outstanding example of valve efficiency.

For it combines a fine grained grey iron head like cylinder block and a carbon steel stem, in one inseparable unit. And there are many reasons why two metals are better than one.

Toledo Standardized Valves are made for replacement in all cars, trucks, tractors and motors. They are neatly boxed and plainly marked. Wholesale stocks are carried in over 800 establishments in the United States and Canada. Ask your jobber.

THE TOLEDO STEEL PRODUCTS COMPANY . TOLEDO, OHIO

VALVES EXCLUSIVELY FOR OVER TEN YEARS



A BRAND NEW IDEA IN SHIMS

Each National Shim consists of a number of layers of shim stock, varying in thickness from .003 up. These are not sent to you loose. Nor are they soldered tight together.

HOW THEY WORK

They are held together by a drop of solder at the top—so that you can pull off a layer—or put back a layer—either one.

No chance for shim compression because there is no solder between leaves. With a pocket knife you can slit through the soft solder and take off a layer or several layers in a jiffy.

DO THIS

National Shims are the only shims that offer you

this unique, time saving, money saving, back saving feature. They are sold in sets for every make of car. And, they are sold in handy boxed assortments containing the most used sizes.

Order from your jobber. Make sure you ask for National Shims. They cost no more than ordinary shims. If your jobber can't supply you, write us direct.

JOBBERS

National Shims are being widely advertised. If you haven't ordered your service stock, send us your order today. We have the best proposition on shims you ever listened to.

NATIONAL MOTOR BEARING CO., 1609 Pine Street, San Francisco, Calif.

Warehouse stocks: 1538 Cherry St., Philadelphia, Pa.; 1449 Michigan Ave., Chicago, Ill.

NATIONAL SHIMS



Do You Realize the Change That's Taking Place in the Automobile Painting Business?

AS surely as motor cars replaced buggies, the new pyroxylin lacquers, applied with spray gun, are replacing brush painting with the old enamels and finishes.

The New Lacquers

The new Pyroxylin lacquers are sweeping the nation! Four-wheel brakes and balloon tires all over again! Every important paint concern is producing or arranging to produce them. Progressive paint shops by the thousands are seeking authoritative information about the new lacquers.

Why They're Popular

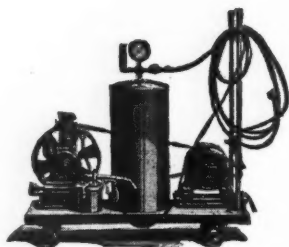
Due to them, the business of repainting motor cars is fast increasing. In this age of speed and mechanical appliances, rather than craftsmanship, lacquers meet a definite need. The motorist gets a beautiful job—quick! The lacquered car requires little or no washing. The finish stays on long enough to give a man his money's worth.

More Painting Now

For these reasons paint shops are coming into their own. Formerly motorists put off their paint job for months, often a year—they didn't want to lay up their cars for three weeks or more. Now they can have their cars lacquered in a week or less. That means business!

This year there will be two, three and four times as much automobile painting done as before. And it will continue to increase because lacquers have so many advantages over the old finishes. Four times as many cars can be lacquered as painted with a hand brush and there's a profit in every job.

Write for complete information on U. S. Paint Spraying Equipment—1/4 to 5 h.p. \$150 up. State how many spray guns you intend to use.



\$150 and up

The United States Air Compressor Co.

5304 Harvard Ave.

Cleveland, Ohio

U.S. Air Compressors

Usaco
TRADE MARK

"How's that
for Speed?"



Cuts 6 times as fast as any other hone

Buddy!—the new Hall Hone has the speed that you have been looking for. It cuts fast and accurately and that's what means profit whether you're working on percentage or operating for yourself.

Consider the advantages of the New Hall Hone. All you need is a half inch drill. The stones won't break because they are clad with a steel housing. You get absolutely no chatter. You get a range of from $3\frac{3}{8}$ " to $4\frac{1}{8}$ " without changing stones or using a larger drill.

Another big feature of the New Hall Hone is in its use with either spring pressure or solid pressure. By simply removing the spring and setting down the adjusting screw you have a solid hone, which makes sizing easy. For fast cutting spring pressure is superior.

Compare the time—compare the quality of the work—**Compare the price**—and you will buy only the New Hall Hone. Write today for our free booklet.

**The Hall Cylinder
Hone Company**

435 Dorr St., Toledo, Ohio

\$35.00

for the
new model



Spring Pressure or Solid Pressure in the One Hone

At a competitive test just completed at the Buick Factory Branch in New York City the New Hall Hone demonstrated a cutting speed of 6 thousandths in 60 seconds and a total of 15 thousandths in $6\frac{1}{4}$ minutes. A check by several mechanics with their gages showed a perfectly parallel and round hole.

It is well known the deeper you cut the softer the iron and the slower the hone will cut. On the sixth run the Hall hone showed a cutting speed of six-thousandths per minute against $\frac{1}{4}$ of a thousandth per minute of the competitive tool.

Various pressures were used and at all stages the New Hall Hone proved conclusively its superiority over the closest competitive make.

Officially O.K.'d by

Buick: For past two years
Chevrolet: Dec. 10, 1924

Rickenbacker:
Dec. 4, 1924

Willys-Overland:
Nov. 1, 1924

Velie: Jan., 1924

Durant: (Canada) 1924

Oldsmobile:
(Canada) 1923-1924

The names of Five more makes will be added to this list within the next 60 days.

Hall's Rubbing Stones

These stones have been developed to facilitate and speed up cutting by removing soft iron from the honing stones and keeping them trued up. They are also useful for dressing emery wheels and preparing metal for painting.

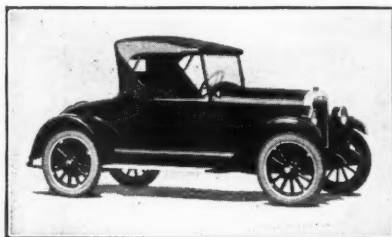
The New CHEVROLET

New value—new quality—a new line of Chevrolet models even better than ever before. Larger and stronger frame—new semi-elliptic chrome vanadium steel springs—stronger axles, rear axle of finest construction, banjo type with greatly strengthened gears—improved, fully enclosed dry plate disc clutch requiring no lubrication,

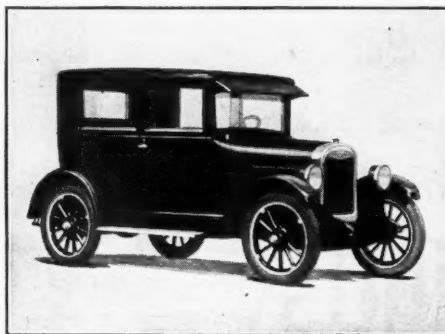
extra heavy brake bands—all models finished in Duco—closed models with new VV one piece windshield and automatic windshield wiper—and many improvements on the powerful Chevrolet motor. These and other new features make the Chevrolet franchise for 1925 one of the most valuable dealer franchises ever obtained.

CHEVROLET MOTOR COMPANY, DETROIT, MICH.

Division of General Motors Corporation



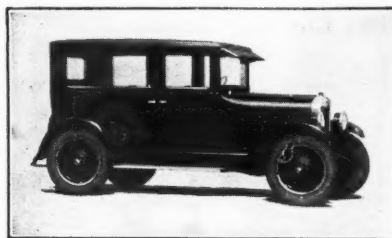
The Roadster



The Coach



The Touring Car



The Sedan

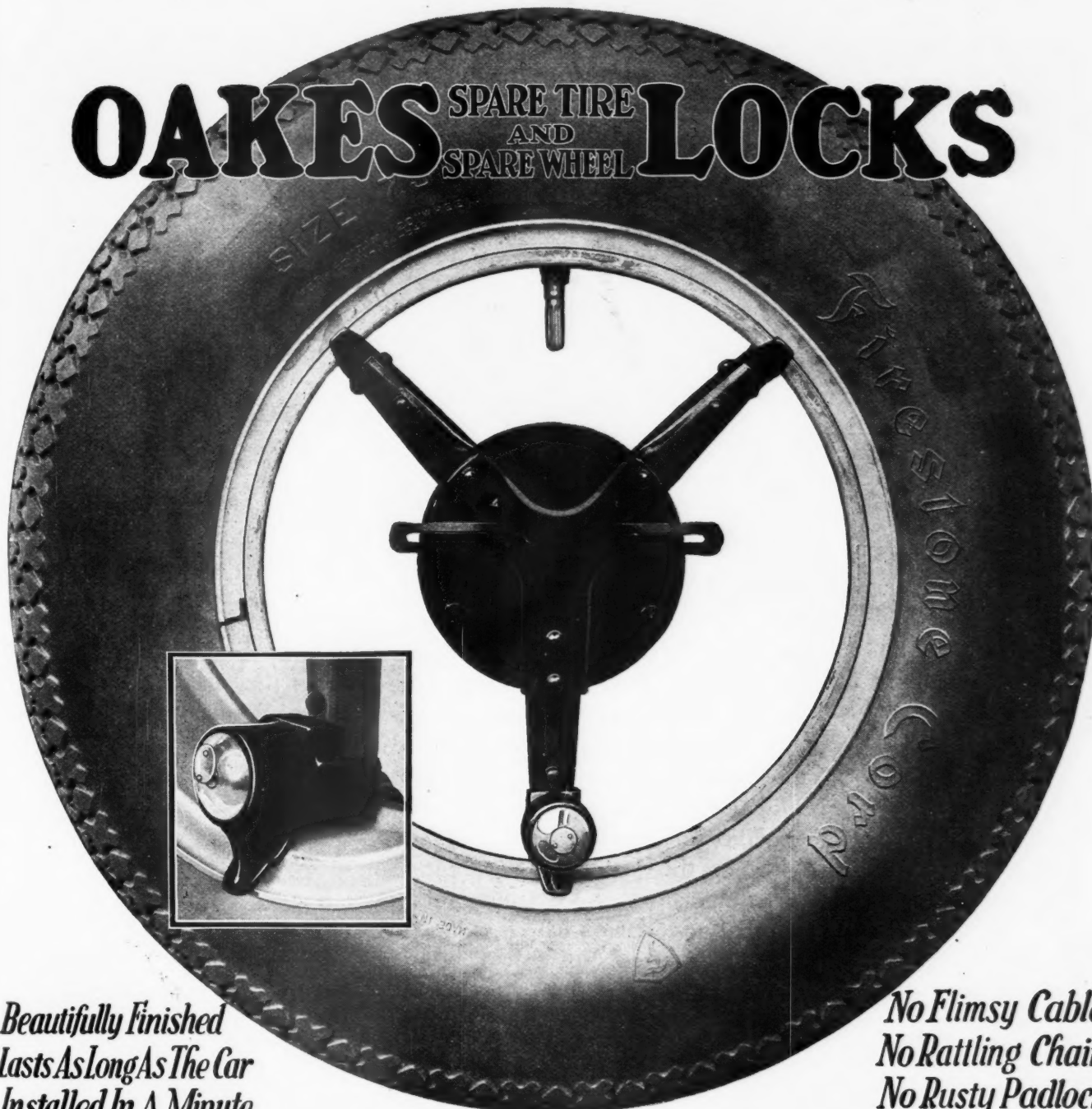
for Economical Transportation



The Coupe

QUALITY AT LOW PRICE

OAKES SPARE TIRE AND SPARE WHEEL LOCKS



*Beautifully Finished
Lasts As Long As The Car
Installed In A Minute*

*No Flimsy Cable
No Rattling Chain
No Rusty Padlock*

Eliminate Make-Shifts!

INSTALL an OAKES LOCK on every car you sell and make an easy extra profit. Put an end to make-shift chains, padlocks and cables. The handsome OAKES LOCK gives complete theft-protection and adds to the distinction of any car. There's an OAKES LOCK for every spare—for tires or disc wheels, standard or balloon tires, single or double, mounted side or rear.

THE OAKES CO.  INDIANAPOLIS
Established 1910



Biflex

Cushion Bumpers

Everything a Dealer Could Ask For

The combined Biflex and Halladay lines offer these distinct advantages:

Biflex or parallel bar, to meet the taste of every car owner . . . A bumper for every car, with a wide range of prices . . .

Interchangeable brackets to reduce the dealers' stocking problem . . . A progressive sales policy that is fixed and that protects the dealer . . . Faster turn-over—greater profit . . . A strong campaign of national advertising which will create not only acceptance, but sales, and behind this great combination—Biflex prestige and Biflex stability.

THE BIFLEX CORPORATION, Waukegan, Illinois

HALLADAY
A Biflex Product





EMPIRE BOLTS NUTS



An Empire cold punched nut is good on any bolt, and an Empire New Process bolt is good on any nut. *But they are best when used together.* Here is gauge-like fit-flawless mating of threads *that just about doubles* the workman's output.

RUSSELL, BURDSALL & WARD
◎ **BOLT & NUT COMPANY** ◎

PORT CHESTER, N.Y.

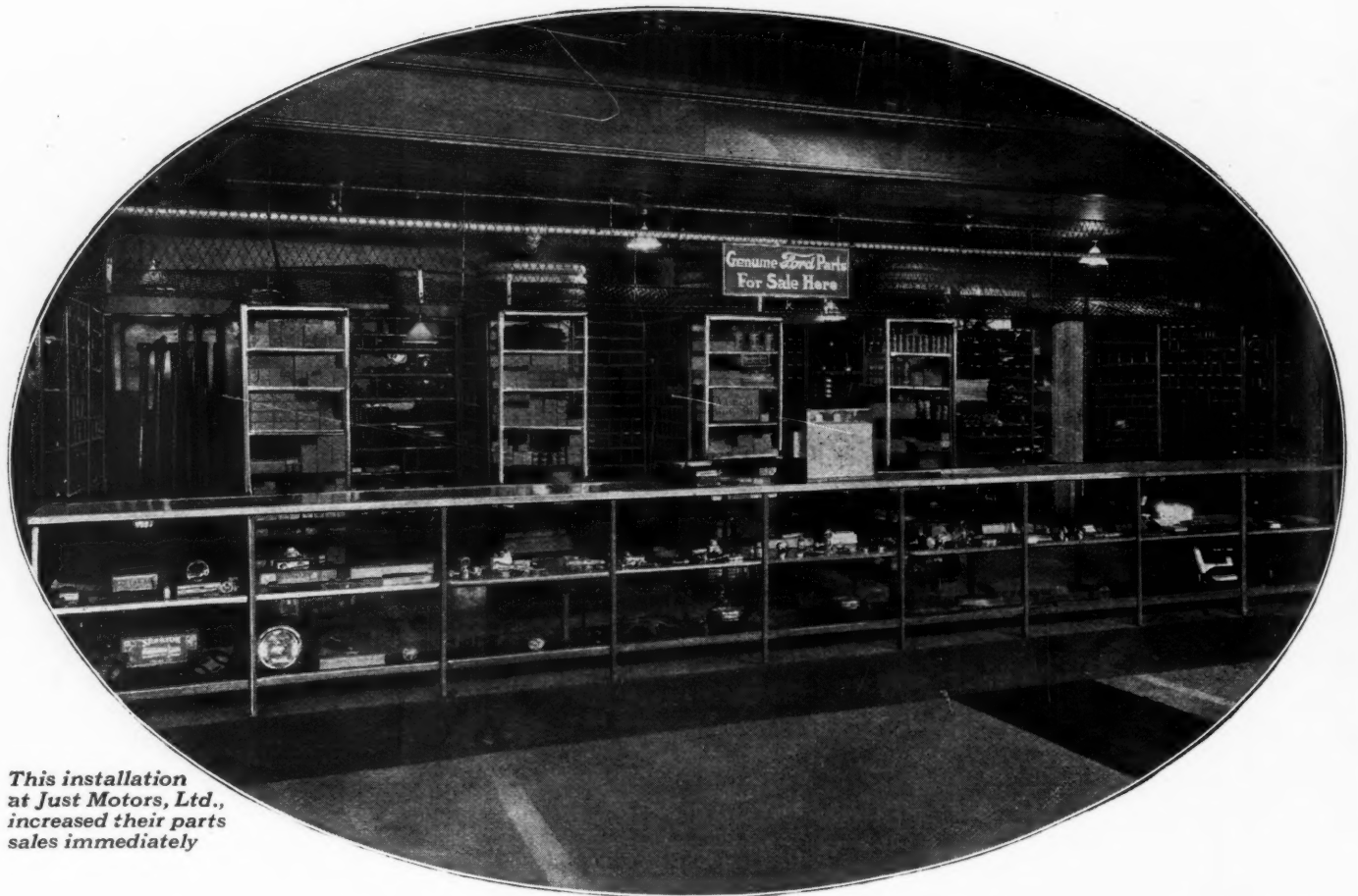
FEMMERWICK, CONN.

CHICAGO

SAN FRANCISCO

ROCK FALLS, ILL.


Makers of Bolts, Nuts and Rivets Since 1845



This installation at Just Motors, Ltd., increased their parts sales immediately

Good Display-Better Service-More Profit

A LAPS System and Lupton Display Counter produce all of these

JUST MOTORS LIMITED

 WE BACK SALES WITH SERVICE
 Montreal, September 3, 1924.

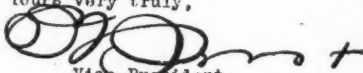
The David Lupton's Sons Company,
 Philadelphia, Pa.

Gentlemen:

One month ago we installed a nineteen unit Lupton System complete with nine sections of show-case, and although we have only had this equipment in use a short time, we are already convinced that we will benefit to a great extent on account of same.

Not only are we able to keep our stock at a normal point, but we are enjoying increased counter sales because of the manner in which the parts are continually before the eyes of the customers.

Wishing you success in the sale of this equipment for Ford Dealers, we are

Yours very truly,

 Vice-President.

TFJust*H
 Firestone Tires "MOST MILES PER DOLLAR"

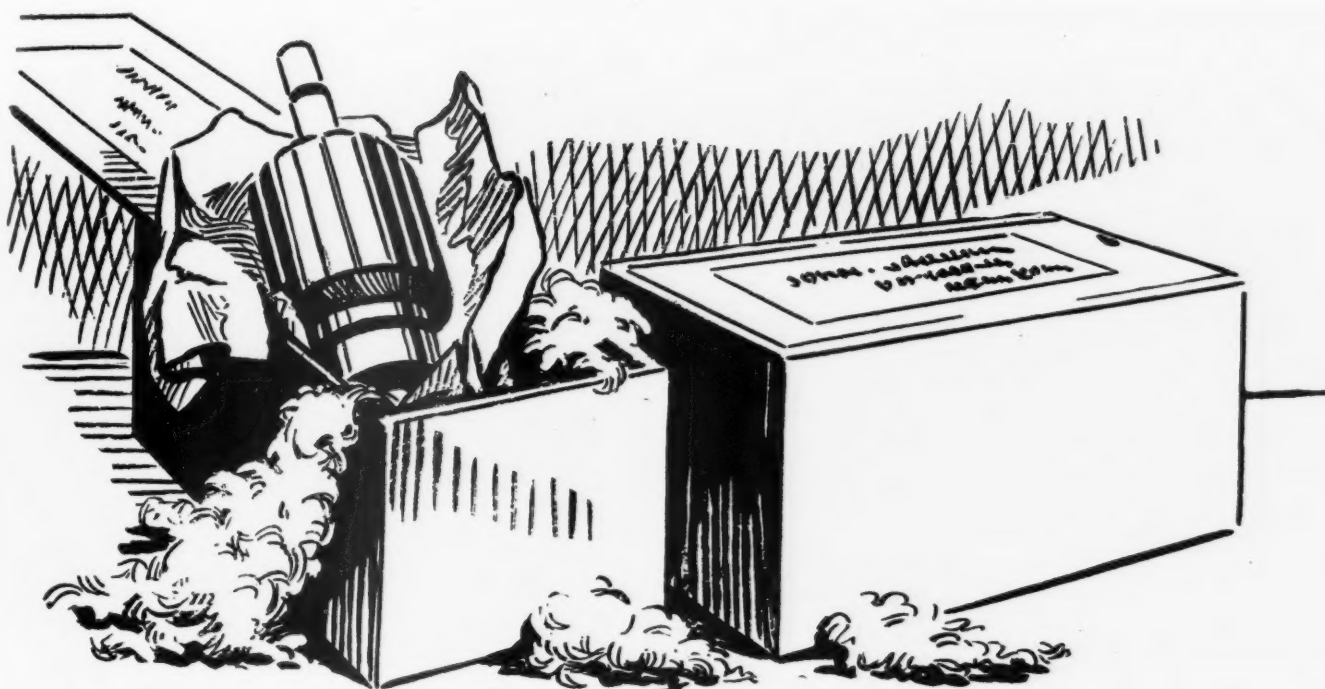
DEALERS everywhere find that as they give prompter service to customers, as they keep their stocks in shape and display parts attractively, business inevitably increases, costs decrease, and the business shows a more satisfactory profit.

A LAPS System and a Lupton Display Counter help a lot to put the dealer's business on this satisfactory basis. They are investment items that pay a handsome dividend in the profits they bring.

Here's T. F. Just of Montreal, for example. He had his installation only a month when he wrote us that he was able to keep his stock better than ever before, and was enjoying increased counter sales. It *always* works this way—better service—good display—more profit.

If you haven't already equipped your place with a LAPS System and Lupton Display Counter, get more information on them without delay. Write your nearest Lupton jobber, or direct to the sole manufacturers,

DAVID LUPTON'S SONS COMPANY
 Main Office and Factory: PHILADELPHIA Sales Office: 2631 Woodward Ave., DETROIT



To Assure "Equal to New" Arrival—

Price List

Net Prices

Ford Generator Armatures	\$1.95
Ford Starter Armatures	2.00
Any make of Two Unit Generator Armatures	4.95
Any make of Two Unit Starter Armature Rewound	6.75

Motor Generator

Northeast	\$11.00
Simms Huff	7.00
Delco	12.00
Dyneto	12.00
Detroit	12.00
Any Vacuum Cleaner Armature	3.50

Our guarantee and our "same day" delivery service has enabled garagemen to promise their customers an "equal to new" armature on a certain date.

Neither quality nor service has ever caused one of these garagemen to disappoint a customer.

One reason for this is the precaution taken to guard against damage after the armature leaves our hands. Before shipping, every Fredericks' Rewound Job is wrapped in heavy Kraft paper and packed in a sturdy box, stuffed with excelsior.

Fredericks' Rewound Armatures *invariably arrive on time, in perfect condition.*

Simply another reason why you should make the H. M. Fredericks Co. your rewinding department.

Try us on your next rewind job. Write for our booklet—"Low Cost Armature Winding Service"—it's free AND INTERESTING.

H.M.FREDERICKS CO.
Armature Winding Specialists
 Lock Haven Penna.

Different and Better!

Kokomo Checkers mean greater sales because:

(1) They make for a riding comfort never before attainable. (2) They will improve the riding qualities of any car already equipped with devices of the spring or strap type. (3) They are a real quality product and LOOK it. (4) They are DIFFERENT—no straps or springs to weaken or break. (5) They "check the rebound" and the resistance they create is in DIRECT RATIO to the SEVERITY of the rebound.

Installed more quickly than any other similar device!

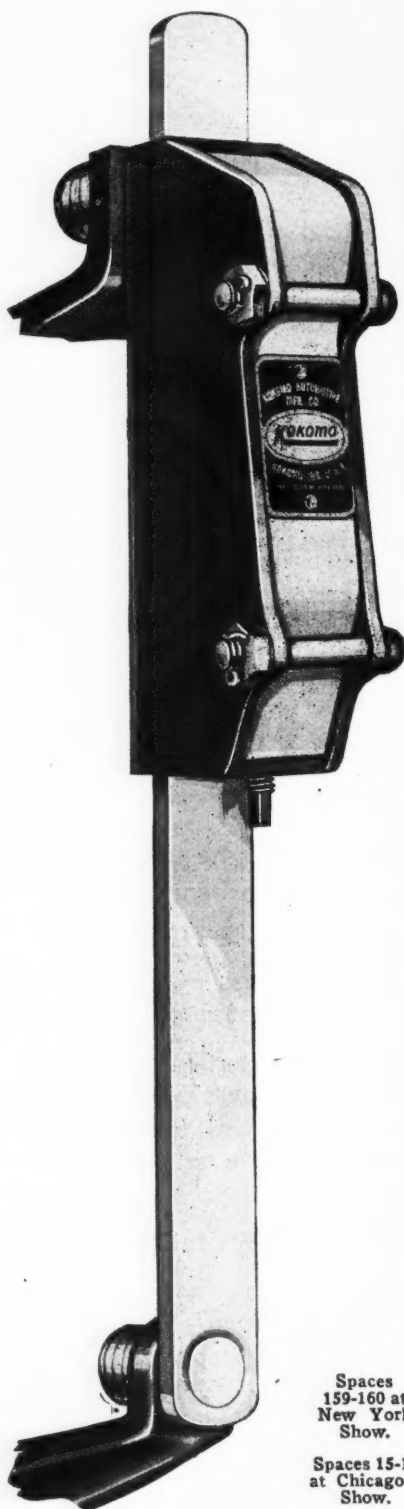
For all light cars—\$17 to \$20—set of four.

Distributors — territory open—WRITE!

Manufactured by

**Kokomo Automotive
Mfg. Co.**
Kokomo, Ind.

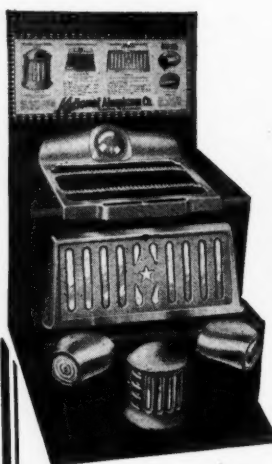
Exclusive
Sales Representatives
THE FULTON CO.
Milwaukee, Wis.



Spaces
159-160 at
New York
Show.

Spaces 15-16
at Chicago
Show.

KOKOMO CHECKERS



National ALUMINUM LINE

This Demonstrator displays our Signal-Light Step Plate, Illuminated Kick Plate, Right-O-Way Running Board, Signal Light, and the Running Board Signal and Courtesy Lamp.

This Demonstrator Says:

"Stop, Look and Buy"

National Aluminum Line counter and window demonstrators are real business builders, not only because they are in line with modern merchandising methods but because they have the advantage of displaying live, distinctive, practical automobile equipment. National Aluminum Line Products are always a step in advance. The purchase of one item builds customer confidence in the complete line.

FREE to Dealers

The two demonstrators pictured here should be in every dealer's store. The one pictured above is wired ready to connect to battery or transformer, showing the items as they actually appear on the car with red or green signal lights. Every car owner is a prospect for one or more of these items.

The demonstrator below, displaying our line of aluminum Accelerator Pedals, Heel Plates and Foot Rests, is as unique as the line itself. The dealer simply pays wholesale price for the items displayed. We mount them on the demonstrator and include the demonstrator stands free.

Get This Business Now

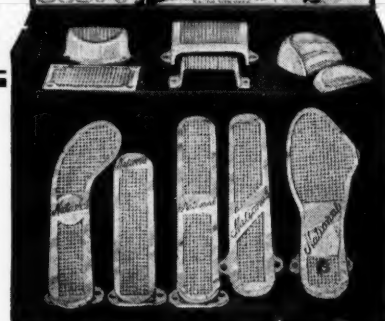
Increase your winter business with this fast-selling line. Wire or write your jobber for this Demonstrator—or write us. Also get our complete catalog.

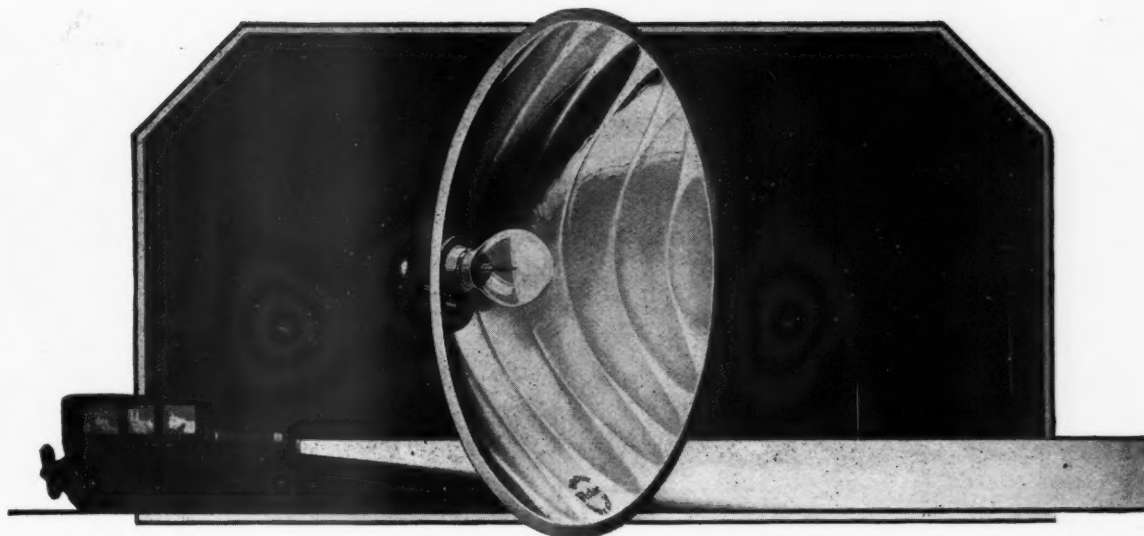
NATIONAL ALUMINUM CO.
Dept. 21 Racine, Wisconsin

The Pedals
Range in
Price from
75c to \$2.00.
Easily
Attached.



Styles for
all cars,
no matter
where the
accelerator
button
is located.





The BROWN REFLECTOR is now a Victor Product

The well known Brown Reflector which has established its merits as efficient equipment for automobile headlamps is now being produced by the Victor organization. In the future it will be marketed as a Victor Product.

This device in order to function properly must be optically correct. It must be absolutely accurate in form and finish. To produce it is an exacting task which calls for the utmost skill and precision equipment.

The very best of equipment and a corps of craftsmen of long experience are the essential factors in this work, and Victor supplies them both. In addition to this, Victor service

will of course apply to this new member of the Victor Line. All Victor Headlamps will be supplied with the Brown Reflector and it will also be available separately for all types of headlamps.

By this new arrangement the trade is assured of a high quality article backed by a first-class service—Victor Service, known to jobbers and dealers as having an eighty-year-old reputation for fair dealing.



You sell the utmost in headlight efficiency when you sell the Victor-Brown Reflector. Investigate today. Write for the details and let us show you how Victor Products bring you the profits.

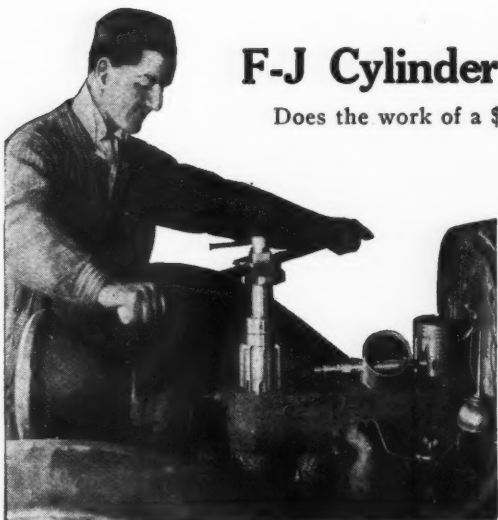
THE CINCINNATI VICTOR COMPANY

714 Reading Road, Cincinnati, Ohio

The Victor Line

TRADE MARK

"There's a Victor Lamp for every Automotive Need"

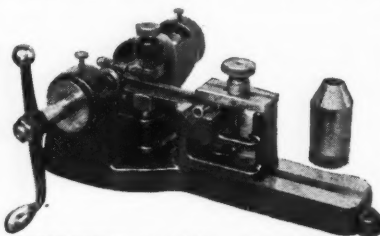


F-J Cylinder Reamer

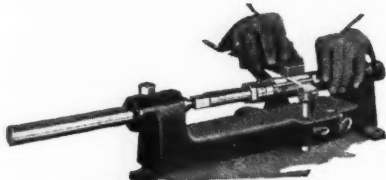
Does the work of a \$3,000 machine

Pin Your Faith to the Foster-Johnson Family of Re-Conditioning Tools

and you will give service which makes and keeps satisfied customers. F-J equipment is the foundation of many a money-making service station. Write for literature and ask for the F-J Station Manual — shows how to get bigger business at bigger profits.

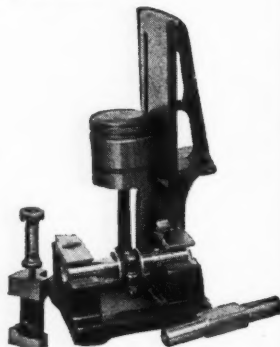


CONNECTING ROD RE-BORING FIXTURE



REAMER SHARPENER
For Servicing Reamers in the Shop.

- F-J Cylinder Reamer
- F-J Cylinder Hone
- F-J Reamer Sharpener
- F-J Connecting Rod Re-Boring Fixture
- F-J Piston Aligner
- F-J Connecting Rod Straightening Vise
- Kylin General Purpose Reamers.



PISTON ALIGNER
A Precision Tool

FOSTER-JOHNSON REAMER CO.

1318 Beardsley Ave.

ELKHART

INDIANA



Be thankful
for **EZY-OUT**

When a screw breaks off—any sort of a screw—away down deep in a hole where it'd be almost impossible to get it out except by blasting—be thankful for the EZY-OUT SCREW EXTRACTOR.

When you have EZY-OUTS, you don't have to bother with files, punches, cold chisels and profanity—

Just reach over to the bench, get your EZY-OUTS, and the whole job's finished long before you could get started the old way.

EZY-OUT SCREW EXTRACTORS are, to-day, an essential part of the shop equipment of every well-organized repair shop. Good managers, almost everywhere, realize that EZY-OUT is an insurance policy—and they never can tell just when they may have to cash in on it.

How to Remove a Broken Screw With "EZY-OUT"

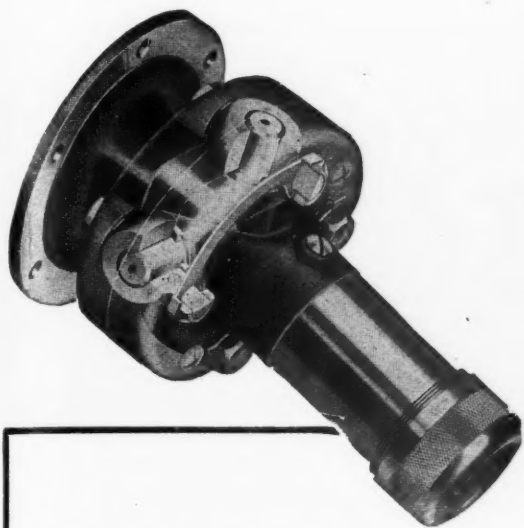
Drill a small hole in the broken end of the screw—just big enough to enable you to insert the business end of the EZY-OUT EXTRACTOR. Insert EZY-OUT, slap on a tap wrench, give it a strong left-hand twist—and the screw will "back out" ON

ITS OWN THREADS! No damage whatever to the threads of the hole—therefore, no re-tapping to do. EZY-OUT does the whole job in from two to ten minutes, as against half an hour to an hour and a half the old way.

EZY-OUT is packed in five handy sets to meet every need, including YOURS. Your local dealer will show you the set you want. If he doesn't stock them, then please write US.

The **CLEVELAND** TWIST DRILL COMPANY
CLEVELAND
NEW YORK-CHICAGO-LONDON

TRADE MARK REG. U. S. PAT. OFF. AND FOREIGN COUNTRIES



Do the Job Once and For All
With a—

"MECHANICS" Oil Lubricated Universal Joint

When a customer comes to you for repairs to his Universal you can "do the job once and for all" by replacing with a "Mechanics." Every time you install a "Mechanics" you make a satisfied customer who will be a booster for your shop and service.

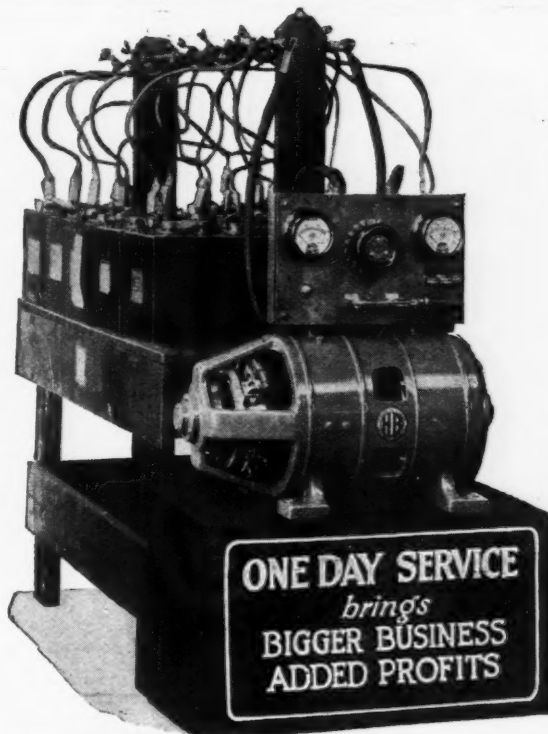
You can assure him that his troubles with the "Universal" are at an end. The only attention his "Mechanics" will require is a filling with oil once or twice a year.

The "Mechanics" comes to you completely assembled, filled with oil, ready to install. You need only cut the shaft,—which is left long,—to the proper length.

The liberal discount and the ease of installation mean a good profit for you.

Write or wire for complete information and prices. Today is the time to do it!

MECHANICS MACHINE CO.
ROCKFORD ILLINOIS



HB One-Day Battery Charging Pays \$150 to \$300 Monthly

HB Users report big monthly profits from HB One Day Battery Charging. With many, Constant Potential Charging has quickly become their biggest money-maker. HB Charging Service puts your shop ahead of competition, makes it the "battery service headquarters" of your city. An HB costs less to buy, and less to operate. Ball bearing, single unit HB design saves current, eliminates costly adjustments. Oversize construction makes it possible for an HB to turn out one-third more work than any other outfit of similar rating. HB Patented Internal Voltage Regulator insures constant voltage, day and night. Far superior to delicate external "regulators."

QUICKLY PAYS FOR ITSELF ON EASY MONTHLY TERMS

Only \$35 cash puts an HB One Day Battery Charger in your shop, complete, ready to operate, with no extras to buy. Easy monthly payments let your outfit pay for itself out of your monthly profits with nice surplus besides. Every HB is built complete in our shops. Big production and direct selling let us save you \$35 to \$115 on purchase price alone on an HB over other outfits.

30 Days' FREE TRIAL on Money-Back Guarantee

No obligation whatever on your part. Order your HB outfit on trial and use it 30 days. If it does not fulfill every claim we make—cut charging costs, bring new business, increase profits, and give more complete satisfaction than any other equipment—you return it, and we will refund every cent you have paid us. You run no risk. Send this coupon with your letterhead or your name and address for free bulletin.

HOBART Bros. Company
Box A 251 Troy, O.
Successful Manufacturers Since 1893

More HB
Constant
Potential
Battery Chargers
are in use
than any other
Make

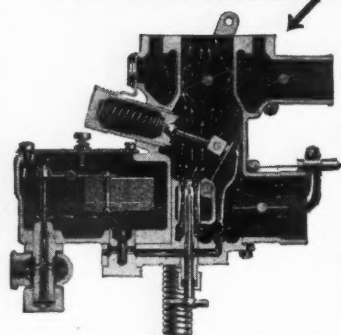
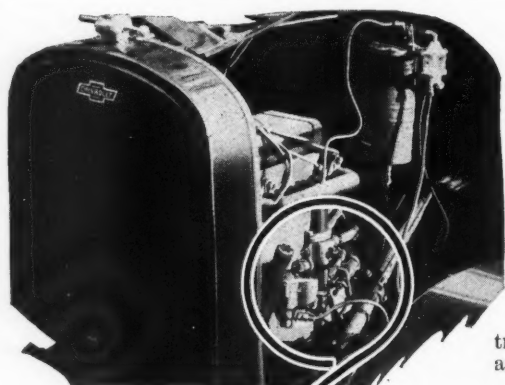
Send for FREE Bulletin

HOBART BROS.
CO., Box A251,
Troy, O.

Send me Bulletin No. 24.

Name

Address



Price
\$18.00
*Slightly
higher on
West Coast*

Notice the Exhaust Gas Heat Inlet Opening and Damper or Door within same. As the Throttle Valve closes, the Heat Damper opens automatically, thus providing the important feature of Automatic Heat Control.

Marvel is Standard Equipment on Buick (for 12 years) and on NASH (for 7 years).

CHEVROLET BECOMES A MARVEL

The long intake manifold on the Chevrolet is usually the cause of trouble in starting the cold engine, of backfire and spitting of the motor, and refusal to throttle low and idle smoothly.

Installation of a Marvel on the Chevrolet raises the carburetor about EIGHT INCHES, thus eliminating the long manifold and keeping the mixture warmed until it enters the cylinders.

Marvel is the ONLY carburetor which secures perfect VAPORIZATION of Gasoline by surrounding the Mixing Chamber with HEAT—Heat automatically regulated by the throttle.

These two features make Marvel the ideal carburetor for every Chevrolet. They will eliminate most starting and idling troubles and will greatly increase the power, flexibility and economy of the Chevrolet motor.

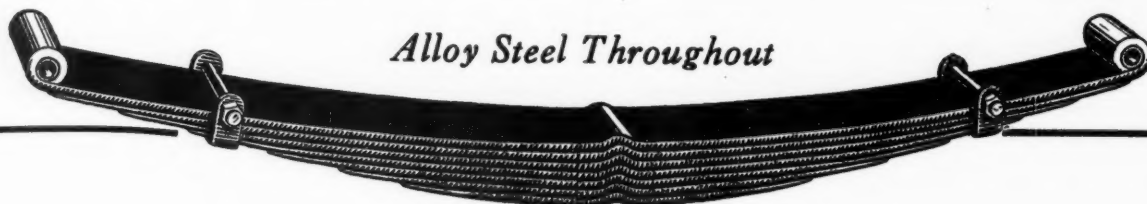
The new Marvel model for Chevrolets is the first step in a new program of one of the oldest, best-established carburetor manufacturers in the automotive field. Other models for popular cars will be announced in the next few weeks.

Every accessory dealer and Service Station will be interested in this field for new business—profitable business. Write today for the Marvel booklet of carburetion facts, "Hot Air That Helps!", and for details of our attractive dealer and distributor proposition.

MARVEL CARBURETOR COMPANY

1100 St. John's Street

Flint, Michigan



Alloy Steel Throughout

If it's highest quality and quickest service you want you can't find a better spring line than the Titanic.

Correctly heat treated alloy steel and nearly forty-five years experience in spring making insure quality not surpassed.

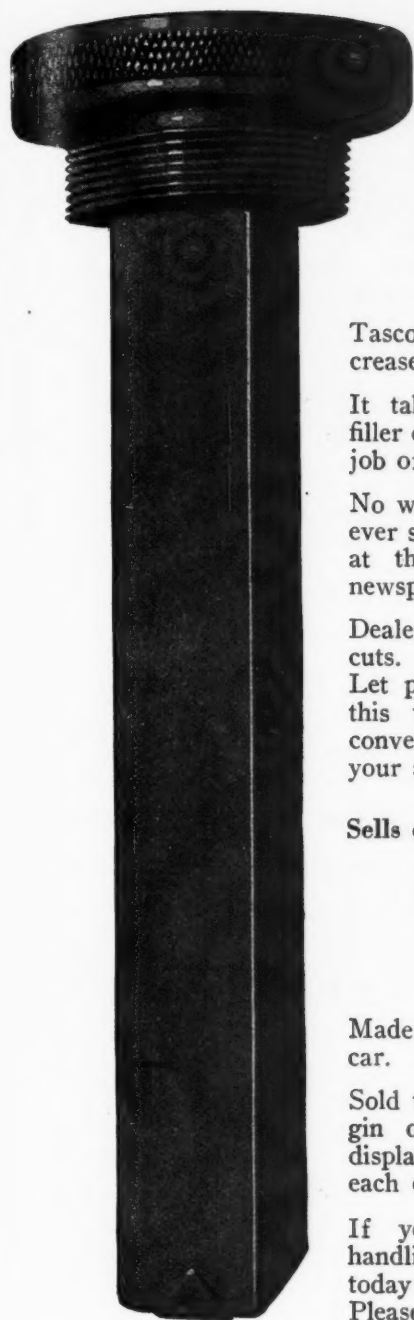
Thorough jobbing distribution and a special service plant provide unequalled quick service.

Tuthill Spring Co., 760 Polk St., Chicago, Ill.

TITANIC

*Springs for Every
Car That's Made*

No Wonder they sell fast!



Tasco gauge sales have increased to 1,000 per day.

It takes the place of the filler cap and saves the mean job of "measuring" the gas.

No wonder they sell wherever shown—in the window, at the pump, in dealers' newspaper ads.

Dealers, send for newspaper cuts. Run them in your ads. Let people know you have this wonderful, low-priced convenience. It will increase your sales.

Sells quick at

\$1.25

Retail

Made to last as long as the car.

Sold to allow a liberal margin of profit. Handsome display card and cut-out in each dozen package.

If you are not already handling "TASCO" write today for liberal discounts. Please give your jobber's name when writing.

The Akron-Selle Co.

"40 Years in Business"

AKRON, OHIO



*More People Use TASCO Gauges—
than any other kind. Look for this Dial*

FORDS, CHEVROLETS and OVERLANDS

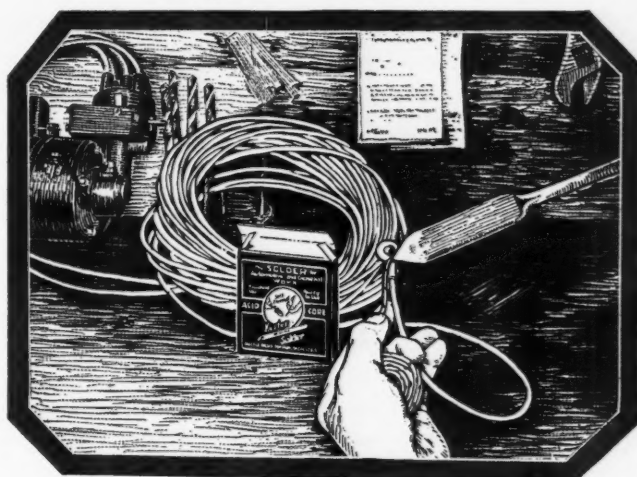
KESTER SOLDER

Self-Fluxing



(Underwriters' Laboratories Inspected)

"Requires Only Heat"



For This Important Work

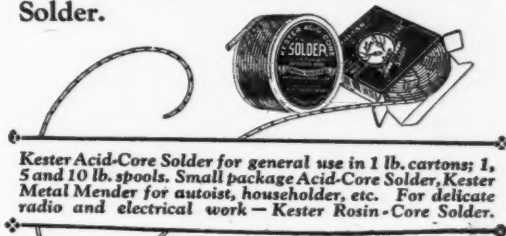
YOU know how important good ignition contacts are to the efficient operation of a motor.

Carelessly twisted wires around the binding post waste "juice." Terminals *soldered* to ignition wires assure a hotter spark because these contacts mean little or no leakage of current.

Use Kester Solder not only to save "juice," but also because Kester saves *time, labor and material* over the old way of soldering.

Kester Solder requires only heat; because inside this hollow wire solder are tiny pockets full of flux. As the solder melts, the correct amount of flux flows to the job, right where it is wanted.

Start saving today by using Kester Solder.



Kester Acid-Core Solder for general use in 1 lb. cartons; 1, 5 and 10 lb. spools. Small package Acid-Core Solder, Kester Metal Mender for autoist, householder, etc. For delicate radio and electrical work—Kester Rosin-Core Solder.

Manufactured by the
CHICAGO SOLDER COMPANY
4203 Wrightwood Ave.
CHICAGO, U. S. A.

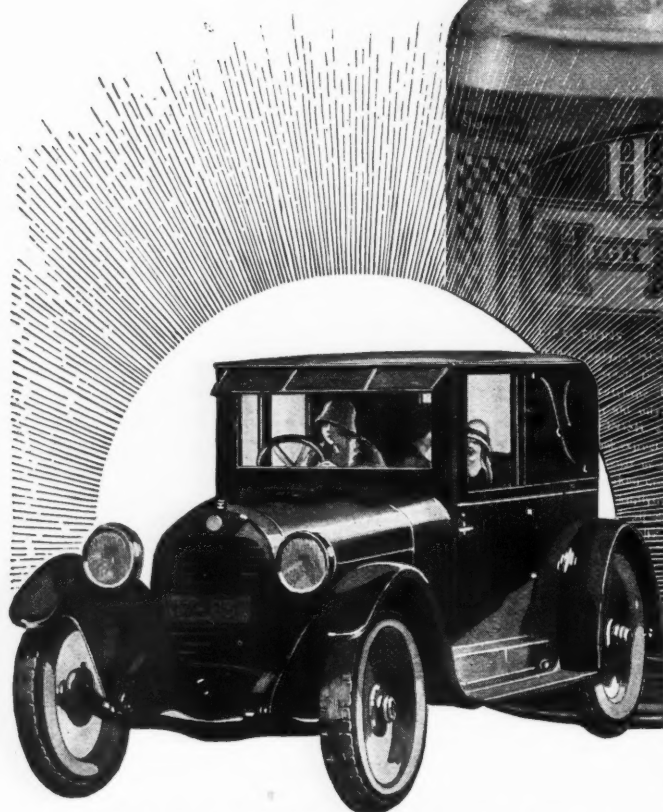
**There is always
a demand for—**

H L F
HIGH LUSTRE FINISH

A QUALITY product: square-deal sales policy and National advertising have given to H L F the leadership it deserves.

H L F is a quality product manufactured by an old-established firm of 30 years' standing. H L F gives a high protective lustrous gloss. Quick, easy, beautiful. Nothing to injure the surface and—no dust-collecting film so often the case with ordinary polishes.

**"CLEAN UP" THIS YEAR
WITH H L F**



Distributed exclusively thru the Jobbing Trade
H. L. FEASEL'S LABORATORY
9-11-13 DESBROSSES ST. NEW YORK, N. Y.

**WHITING-ADAMS
BRUSHES**

Any paint and any paint-brush may "save the surface —" BUT it takes good paint and a good paint-brush to save a surface well enough to be worth "saving" again!

WHITING-ADAMS BRUSHES have been saving surfaces for 116 years. Save your surfaces with a brush that knows the job!

Do it with WHITING-ADAMS BRUSHES

SEND FOR ILLUSTRATED LITERATURE
JOHN L. WHITING-J. J. ADAMS CO., BOSTON, U. S. A.
Brush Manufacturers for Over 116 Years and the Largest in the World

Sell the new
TELTAILITE
(Patented)

An attractive accessory that will net you a good profit.

**Automatically Lights When
Stop Light Works**

A necessary protection in heavy traffic. Shows courtesy lights and signals driver that stop light is working. A beautiful ornament for any car. Made in Motometer Type, \$3.00 (screws on back of Motometer); Lantern Type, \$3.50 (screws into radiator cap); Dash Type, \$1.25. Easily installed. Works with any stop light.

Write for details. Buy them from your jobber.
Imperial Brass Mfg. Co.
1217 W. Harrison St. CHICAGO, ILL.
MAKERS OF IMPERIAL PRIMERS

Motometer Type
Front View

Motometer Type
Driver's View



DIXON'S 677
For Transmissions and Differentials

A graphite lubricant that flows freely over gears in operation, yet will not squeeze out under load nor run from the gears when idle.
 It resists cold, permitting gears to shift as easily in freezing weather as in midsummer and shows minimum power losses.
 No. 677 by providing a durable film of lubricant, lowers friction so that wear on gears and bearings is reduced to the minimum.

Write for Booklet 82-G and dealer prices
JOSEPH DIXON CRUCIBLE CO.
 Jersey City, New Jersey
 Est. 1827



Protexalls for 1925

Our Service Is Complete

We have been manufacturing Protexalls for the past 35 years and can offer you complete service in all branches.

Our line of several grades of garments in blue, khaki, white and stripes has been perfected by many years experience in making high-grade work clothes.

Protexalls for Advertising

We are the originators of advertising lettering service. You may have your name or trade-mark stitched in fast color turkey red on every Protexall you order. - - - "Lettered Protexalls will help you in your advertising."

We ship promptly from six factories and can handle large or small orders PROMPTLY. "Protexalls are packed in individual dust-proof cartons."

Sold Only Through Jobbers

THE PROTEXALL COMPANY

ESTABLISHED 1889

Abingdon, Ill.

312 West Second South St., Salt Lake City, Utah



A Happy New Year Start Off Right and You'll Continue Right THE K-D AUTO LAMP LINE

stands for all that is best in lamp manufacture, distribution and sale. That obstacle "sales-resistance" is absent because your customers quickly appreciate the big value embodied in every K-D Lamp.

The line for 1925 is so big that you can satisfy every customer every time.



Includes two sets Brackets

No. 200 STOP LAMP

Here's a stop lamp which will give 100% service and satisfaction. Built sturdily to last for years. Throws a rapid warning which the car behind cannot overlook.

Made in one piece from suitable gauge steel, black enamel baked on. Brass door, polished and nickel plated. Special amber lens showing "stop" when brake is applied. Enclosed type switch. Packed in individual cartons.

DRUM TYPE SPOT LAMP

Specially designed to harmonize with latest Head Lamps. Made in two finishes, ALL NICKEL or BLACK AND NICKEL. Lamp is double shell construction, made entirely from BRASS, including bracket, therefore will not rust or corrode.

The bracket is made in two types, for either closed or open car, the open car type is of recent design and suitable for use on either a round or square windshield. Cord, four feet long, furnished for attaching. Each lamp packed in individual carton.

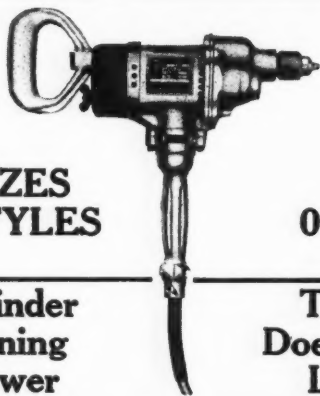
No. 24

Square type Side Lamp for use on closed cars; has special hollow bracket, through which wires pass, with plate which is fastened to frame of car with two screws. Design patent pending.

Body is formed from heavy gauge metal. Inside lining is highly polished and plated. Bulbs are 2 a. p., 6-8 volt, single-circuit wiring system only. Finished black enamel, baked on, with nickel trimmings only.



THE K-D LAMP CO.
Cincinnati, O.



64 SIZES
and STYLES

0 to 2"

**Cylinder
Honing
Power**

**That
Does Not
Lag**

PAY A LITTLE MORE—GET MUCH MORE
We are not a bit backward about saying that THOR DRILLS cost more than some electric drills but there is a reason for it.

That reason is your assurance that your drill will be a good investment.

There is going to be a tremendous volume of car RECONDITIONING work and we urge you to use the very best tools at the outset.

Write for our new illustrated catalog today

INDEPENDENT PNEUMATIC TOOL CO.

600 W. Jackson Blvd. 1463 Broadway
Chicago, Ill. Branch Offices Everywhere New York City

Thor

**UNIVERSAL
ELECTRIC
DRILLS**

UNITED STATES Portable Electric DRILLS



Jobs you never knew

FREE!

could be accomplished with a portable drill are described in this new "Handbook of Portable Electric Drill Practice." Good mechanics everywhere have helped to compile it by sending in practical suggested uses in competing in our recent prize contest. It's well worth having. Sent FREE! Write now for your copy.

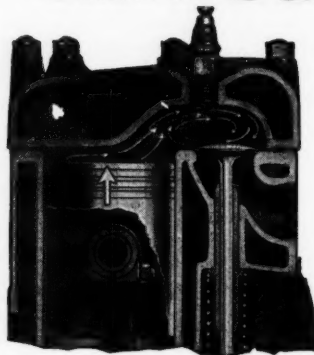
**THE UNITED STATES
ELECTRICAL TOOL CO.**
CINCINNATI, OHIO

District Sales Offices and Service Stations
Boston Buffalo Chicago Cleveland Detroit Houston
Kansas City Minneapolis New York Philadelphia
Pittsburgh St. Louis Toledo
Complete stocks carried in all Service Stations.



"The Good Mechanic Knows"

The Ricardo Head



And now for Busses—a 6 cylinder Ricardo Ell Head Engine that develops *one hundred* horsepower! Write for complete details.

WAUKESHA
Motor Company
ENGINE BUILDERS
Waukesha, Wisconsin
New York, N. Y.

USE A STORM HONE

It handles an important part of your cylinder work. Takes all sizes of cylinders from 2 3/4" to 8". The deep, heavy, wide faced stones on the Storm Hone mean longer life, faster cutting and smoother finishing as well as freedom from chatter and stone breakage. Complete and with extra equipment only \$40.25.

Write for the Storm Book,
"Modern Cylinder Methods"

STORM Mfg. Co.

406 A Sixth Ave. So.
Minneapolis Minn.



UNION FUSES AND ACCESSORIES

Fuses for every make of car. Fuse Block protects Ford lights and wiring. Also Fuse Boxes, special parts, stampings, etc.

Guaranteed satisfactory by oldest and largest manufacturers of electrical protecting devices. Write for catalog

CHICAGO FUSE MFG. CO.

Chicago New York

FORD FUSE BLOCK



No. 1 AB



No. 2 AB



UNION



"I insist on

TRINDL

PISTON PINS
and
WARP PROOF VALVES"

They are absolutely perfect in workmanship and finish. They are marked with stock number and oversize. No chance for mistakes. Pins are made in standard, .003, .005, .010, .015 and .020 oversize. Valves are made in standard, .015 and .031 oversize. You can't go wrong with Trindl products. They are

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There's a whale of a national demand waiting for you on this fast-moving replacement part guaranteed to stop oil pumping and piston slap and to increase power, pick-up and performance without reboring cylinders.

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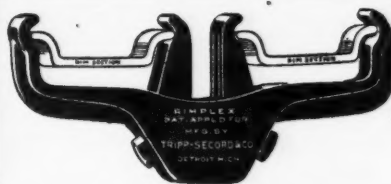
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It outsells 'em all.
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Made and guaranteed by

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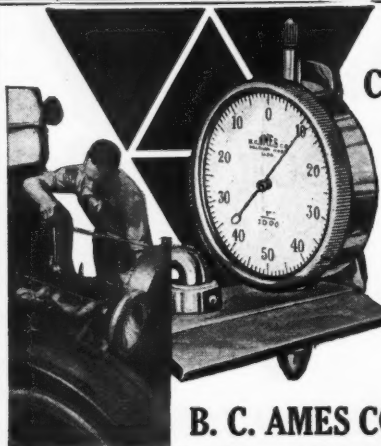
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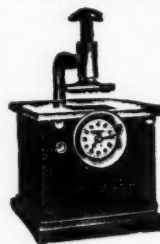
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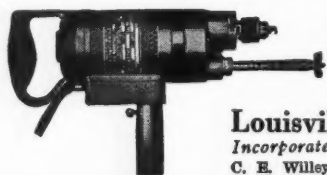
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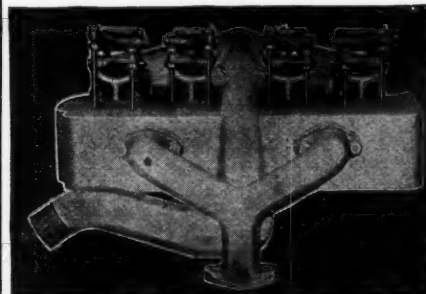
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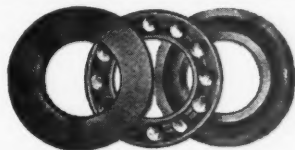
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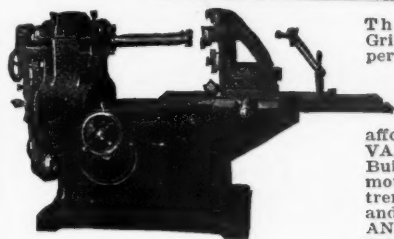
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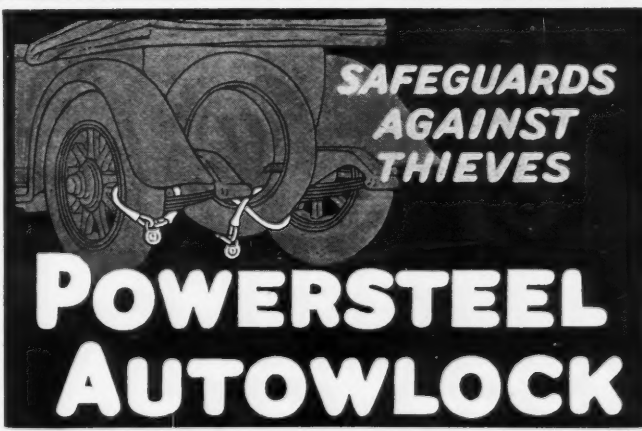
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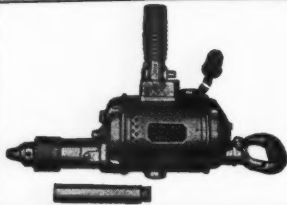
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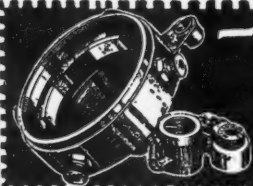
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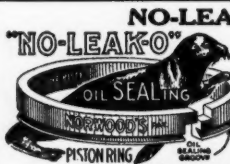
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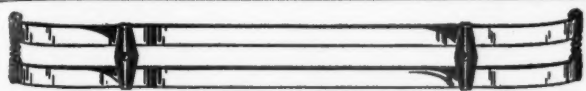
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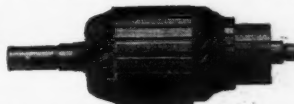
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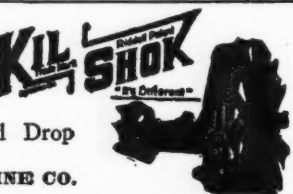

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Block, Chicago, 341 Leader News Bldg., Cleveland, O.

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FOR SALE—Five-corner vacant land on two main high-
ways. Suitable for garage and service station, 35 miles
west of Chicago. Address Box 6212, care of MOTOR
AGE, 5 S. Wabash Ave., Chicago, Ill.

HELP WANTED

WANTED SALESMAN for stamping and tools by an amply
financed company. Plant located in central states. One
who is able to assume responsibility of keeping plant filled
with profitable business, for such an individual attractive
proposition is offered. All correspondence held strictly con-
fidential. Address Box 6211, care of MOTOR AGE, 5 S.
Wabash Ave., Chicago, Ill.

SITUATIONS WANTED

SITUATION WANTED—Automobile Service Manager, four-
teen years' experience, open for engagement. Can qualify
in any branch of the automotive industry. Address Box
6210 care of MOTOR AGE, 5 S. Wabash Ave., Chicago, Ill.

RACING EQUIPMENT

REAL RACING CARS

CLIFF WOODBURY'S famous Frontenac for sale. Holds
all Central States Records. Also 300 cu. in. Peugeot
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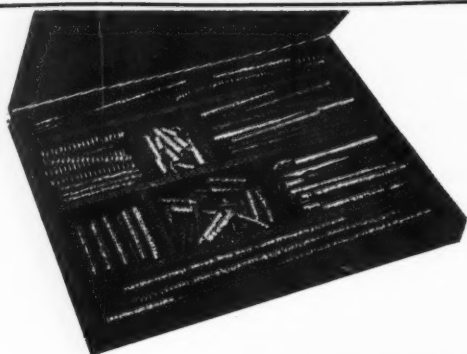
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FOR \$3.00 A YEAR YOU CAN
GET ONE LIKE IT EVERY
WEEK

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Small outlay - Big Profits



\$3.50
LIST

PECK GARAGE ASSORTMENT

Earn good money on spring replacements from this PECK Garage Assortment. The most needed sizes in generous quantities. A \$3.50 investment yielding big profits on replacement jobs. You'll like the strong partitioned box included with this set. Mention Jobber when ordering. The Peck Spring Co., Plainville, Conn.

MORRISON AUTOMATIC DOUBLE RANGE Worm Drive JACKS



Made in 9 sizes for all service requirements. Special model for Balloon Tires.

Can't slip or tilt

The flexible steel "Sure Hold" cap prevents dangerous slipping. The long folding handle (36" to 72") operates from standing position.

High class construction throughout. Vanadium steel gears and standard make bearings.

Write for sample for test.

Woods Engineering Co.
Alliance, Ohio

This Jack has been furnished as standard equipment on high class passenger cars, trucks, buses and fire engines for the past 4 years.

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Seals the head *TIGHT!*



**Does Not Melt or
Stick — BUT
FILLS and
STAYS!**



To seal that gasket and head we pass along the good word of thousands of users that "Key Graphite Paste makes a 100% sealed joint"—

AND—that's very necessary.

The least leak is costly, and Key Paste with its Graphite base "Fills every irregularity" between block and gasket.

KEY is equally as efficient for stopping corrosion on battery terminals; for spring lubrication; for hose connections; for manifold painting; for body squeaks—and dozens of other uses. Put it on threads of bolts before the nut is placed and prevent rusting on, etc., etc.

Distributors being added. Dealers write direct if jobbers in your community have not stocked Key Graphite Paste.

KEY BOILER EQUIPMENT CO.

27TH AND McCASLAND AVE.
EAST ST. LOUIS, ILL.

Sample FREE

Key Boiler Equipment Co.

27th and McCasland Ave., East St. Louis, Ill.

Please send me without charge or obligation a sample of Key Graphite Paste.

Name

Firm

Address

M.A.1-1-25

Be alive in 1925!

Now is the time to hit your stride to carry you through 1925.

With more cars registered than ever before in the history of the world, the market for motor re-conditioning is enormous.

It's going to be the live repairman and re-conditioner who'll make the big profits from this market.

Remember—The best profits are in the best parts. Poor replacement parts can ruin a good mechanical job.

During 1925, the McQuay-Norris line will continue to be the most complete in its field.

When you check over your profits next December, you'll be glad you got an early start on a big year with the McQuay-Norris line.

McQUAY-NORRIS

PISTON RINGS - PISTONS - PINS - BEARINGS

1



5

A Profit Policy

Make this your policy for 1925 and you will make more money on Ford Foot Throttles than you ever made before.

Handle One Good Line

Concentrate exclusively on one good line of Ford Accelerators. This will simplify buying, stock-keeping and eliminate slow moving merchandise.

Show Two Models

Show every prospect the Williams "Regular" at \$2.50 and the Williams "Junior" at \$1.50. You'll make a great many \$2.50 sales. Naturally, there is more profit for you in a \$2.50 sale than in a \$1.50 sale.

Sell the Best

In every field, whether it be automobiles, hats or pianos, there is one best. One leader in each field that has won leadership by offering the greatest-value-per-dollar. In the Ford Foot Throttle Field, the Williams Accelerator is the best. This you can prove by comparing volume of sales—by comparing actual construction—by comparing ease and simplicity of installation or operation.

Start Now

Now is the time to start this success policy—a policy of proven soundness that will yield you more profit with less effort. Order a service stock of Williams Accelerators from your jobber today. Both models—Williams "Regular" at \$2.50 and the "Junior" at \$1.50. Warehouse stocks carried at Chicago and New York.

WILLIAMS

ACCELERATORS

WILLIAMS BROS. AIRCRAFT CORP.
25TH AND POTRERO AVENUE
SAN FRANCISCO, CALIFORNIA

Regular
Model
\$2.50

Junior
Model
\$1.50





A few specimens of Edison MAZDA Auto Lamp advertising of last year.

In 1924 Edison MAZDA Auto Lamps

were one of the most extensively advertised products in the automotive field.

In 1925

you will receive even greater sales help if you handle
Edison MAZDA Auto Lamps.

For complete details of this year's intensive effort write to the
Edison Lamp Works of General Electric Company, Harrison, N.J.

EDISON MAZDA LAMPS

A GENERAL ELECTRIC PRODUCT